Vol. 1028 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

March 15, 1983

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 15, 1983 Volume 1028 Number 3

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1028 OG 18
Reissue Applications Filed	1028 OG 18
Request for Reexamination Filed	1028 OG 18
Extensions of Time in Reexamination Proceedings	1028 OG 18
Service by Publication	1028 OG 19
Patent Suits	1028 OG 19
Notice of Availability for Licensing	1028 OG 22
Patent Certificates of Correction	1028 OG 25
Disclaimers	1028 OG 25
Dedication	1028 OG 25
Disclaimers and Dedications	1028 OG 25
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1028 OG 26
Condition of Patent Applications	1028 OG 27
Reexaminations	1028 OG 29
Reissue Patents Granted (31,173)	427
Plant Patents Granted (4,990)	431
Patents Granted	
General and Mechanical (4,376,312)	433
Chemical (4,376,632)	545
Electrical (4,376,872)	611
Design Patents Granted (268,220)	657
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 26
Classification of	
Patents (Including Reissues and Reexaminations)	PI 29
Designs and Plants	PI 31
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 32
Designs and Plants	PI 33
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,297,422, Re. S.N. 378,157, Filed May 14, 1982, Cl. 65/54, METHOD OF MAKING MOLDS FOR MULTI-FOCAL OPTHALMIC LENSES, Stanley A. Emerson, et al., Owner of Record: *Camelot Industries, Burlington, Mass.*, Attorney or Agent: Leo R. Reynolds, Ex. Gp.: 173

4,062,170, Re. S.N. 452,472, Filed Dec. 23, 1982, Cl. 53/390, APPARATUS FOR LOADING BAGS, William G. Oren, Owner of Record: *Mobil Oil Corp., New York, N.Y.*, Attorney or Agent: Michael G. Gilman, Ex. Gp.: 324

4,256,141, Re. S.N. 449,313, Filed Dec. 13, 1982, Cl. 137/557, RELAY VALVE FOR FLUID ACTUATORS, Clifford M. Peters, Owner of Record: *W-K-M Wellhead Systems, Inc., Shreveport, La.*, Attorney or Agent: Marvin J. Marnock, Ex. Gp.: 341

4,308,901, Re. S.N. 449,151, Filed Dec. 13, 1982, Cl. 141/114, AGRICULTURAL BAG LOADING APPARATUS BRAKING MECHANISM, Richard H. Lee, Owner of Record: *AG-Bag Corp., Arlington, Nebr.*, Attorney or Agent: Michael A. O'Neil, Ex. Gp.: 243

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Extensions of Time in Reexamination Proceedings

This notice is intended to clarify extension of time practice as it relates to reexamination proceedings, and supplement the provisions of Section 2265 of the Manual of Patent Examining Procedure (MPEP).

The provisions of 37 CFR 1.136(a) and (b) are *NOT* applicable to reexamination proceedings under any circumstances . Public Law 97-247 amended 35 U.S.C. 41 to authorize the Commissioner to charge fees for extensions of time to take action in an "application". A reexamination proceeding does not involve an "application". 37 CFR 1.136 authorizes extensions of the time period only in an application in which an applicant must respond or take action. There is neither an "application", nor an "applicant" involved in a reexamination proceeding.

Requests for an extension of time to file a patent owner's statement under 37 CFR 1.530 or respond to any Office action in a reexamination proceeding must be filed under 37 CFR 1.550(c). These requests for an extension of time will be granted only for sufficient cause and must be filed on or before the day on which action by the patent owner is due. In no case will mere filing of a request for extension of time automatically effect any extension. Although the appeal provisions of 37 CFR 1.192(a), 1.197(b), and 1.304(a) set time periods applicable to reexamination as well as application proceedings, they also include a further proviso making these time periods subject to the extension provisions of 37 CFR 1.136. However, for the reasons set forth above, the extension provisions of 37 CFR 1.136 are limited to application proceedings and do not apply to reexamination proceedings. Therefore, any request for an extension of time in a reexamination proceeding to file a brief or reply brief, a request for reconsideration or rehearing, or a notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, will be considered under the provisions of 37 CFR 1.550(c). The regulations setting a time period in which any of these actions must be taken set a time for reply within the meaning of 37 CFR 1.550(b), which time can be extended under 37 CFR 1.550(c).

The extension-of-time practice in reexamination proceedings in which a final Office action has been mailed continues to be reflected in MPEP Section 2265. That is, the after-final practice in reexamination proceedings did not change Oct. 1, 1982, and the automatic extension of time policy for response to a final rejection and associated practice are still in effect in reexamination proceedings.

Extensions of time for a requester of a reexamination, who is not the patent owner, are available only in rare circumstances. A request for an extension of the time period to file a petition from the denial of a request for

reexamination can only be entertained by filing a petition under 37 CFR 1.183 with appropriate fee to waive the time provisions of 37 CFR 1.515(c). No extensions will be permitted to the two-month time for filing a reply by the requester under 37 CFR 1.535. This two-month period is set by statute (35 U.S.C. 304) and cannot be extended.

GERALD J. MOSSINGHOFF,
Feb. 17, 1983. *Commissioner of Patents and Trademarks.*

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Nu-Dor Corp., Roselle, Ill., Reg. No. 1,089,718, for the mark "NU-DOR", Canc. No. 13,403.

Commodore Import Co., assignee of Dorothy Schneider, d.b.a. Continental Sales Sewing Machine Co., Brooklyn, N.Y., Reg. No. 585,784, for the mark "JAGUAR", Canc. No. 13,405.

Majestic Furs, Ltd., Bismarck, N.D., Reg. No. 1,097,031, for the mark "MAJESTIC FURS", Canc. No. 13,426.

Tivoli Brewing Co., Denver, Col., Reg. No. 743,538, for the mark "HI-EN-BRAU" and design, Canc. No. 13,619.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,932,591. Surface Activation Corp., DIELECTRIC COATED ELECTRODES, **filed** Jan. 8, 1982, D.C., S.D.N.Y., Doc. 81-Civ-76 CSH, *Surface Activation Corp.* v. *Texas Instruments, Inc.* Plaintiff is the owner of Pat. No. 2,932,591. Final Judgment on Consent entered Oct. 6, 1982.

3,078,085, Thomas A. Bank, VEHICLE SUSPENSION; **3,438,309,** Jacques Boileau, PNEUMATIC SPRINGS, **filed** Aug. 19, 1982, D.C. District of Columbia (Wash. D.C.), Doc. 82-2346, *Lear Siegler, Inc.* v. *Gerald J. Mossinghoff.*

3,151,503, Clark Equipment Co., TRANSMISSION SYSTEM; **3,231,117, same,** TRACTOR VEHICLE AND DRIVE THEREFOR; **D. 195,254, same,** SELF-PROPELLED LOADER, **filed** July 24, 1973, D.C. N. Dak. (Fargo), Doc. 4839, *Louis J. Keller, et al.* v. *Clark Equipment Co., et al.* Stipulated Order for Judgment filed Aug. 2, 1982. **Same, filed** Aug. 7, 1973, D.C. N. Dak. (Fargo), Doc. 4875, *Clark Equipment Co., et al.* v. *Louis J. Keller, et al.* Stipulated Order for Judgment filed Aug. 2, 1982.

3,231,117. **(See 3,151,503.)**

3,298,030, Gould, Inc., ELECTRICALLY OPERATED CHARACTER PRINTER; **3,596,275,** A. B. Dick Co., FLUID DROPLET RECORDER, **filed** July 5, 1978, D.C., S.D. Ohio (Dayton), Doc. C-3-78-177, *Mead Digital Systems, Inc.* v. *A. B. Dick Co. and Gould, Inc.* Pat. No. 3,298,030 declared invalid. Final Judgment filed Jan. 26, 1982. **Same, filed** Jan. 10, 1978, D.C., N.D. Ill. (Chicago), Doc. 78 C 0075, *A. B. Dick Co., et al.* v. *Burroughs Corp.* Memorandum opinion and order entered on Nov. 5, 1982. Accordingly, defendant's motion for summary judgment as to Pat. No. 3,596,275 is granted.

3,303,677, Charles A. Bauer, PICK-RESISTANT LOCK AND KEY THEREFOR, **filed** Oct. 15, 1982, D.C. Hawaii (Honolulu), Doc. 82-0600, *Kidde, Inc.* v. *Charles T. S. Yee, doing business as The Lock Doctor.*

3,318,146, DeLeo and Hagen, PRESSURE SENSING INSTRUMENT FOR AIRCRAFT, **filed** July 20, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 3570, *Rosemount, Inc.* v. *The Garrett Corp., et al.*

3,333,198, Mandell and Brownstein, TELEVISION CONVERTER FOR CATV SYSTEM, **filed** Apr. 13, 1978, D.C. Colo. (Denver), Doc. 78-W-398, *Teleprompter Corp.* v. *Athena Cablevision Corp.* Pat. No. 3,333,198 is valid and infringed by Defendant. Complaint dismissed without prejudice on Jan. 29, 1980. **Same, filed** Oct. 18, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78-3478 (JSL), *Oak Industries, Inc., et al.* v. *The Jerrold Div., General Instrument Corp.* Pat. No. 3,333,198 is valid and infringed by Defendant. The above-captioned action, including all claims and counterclaims, are finally resolved and are res judicata between the parties. Fi led Oct. 13, 1982.

3,334,126, Miyazaki, Hashimoto, et al., ARYL N-METHYL SUBSTITUTED THIONOCARBAMATES, **filed** Nov. 1, 1982, D.C.N.J. (Newark), Doc. 82-3651, *Schering Corp.* v. *Estee Lauder, Inc.*

3,349,829, Guy E. Dixon, TRACK SEAL FOR FOLDING DOORS, **filed** Sept. 22, 1982, D.C., M.D. Fla. (Orlando), Doc. 82-485-ORL-CIV-R, *Panelfold, Inc.* v. *Woodfold-Marco Mfg., Inc., et al.*

3,360,162, Robert F. Miles, TOTE BOX, **filed** Nov. 17, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-74340, *Nestier Corp.* v. *Venture Industries Corp.*

3,364,459, Leslie L. Schiller, UNIVERSAL SPARK PLUG TERMINAL CONNECTOR; **4,073,565,** Eugene B. Raymond, SPARK PLUG TERMINAL, **filed** Oct. 25, 1982, D.C., S.D.N.Y., Doc. 82-Civ-7044, *Zierick Mfg. Corp.* v. *Triple A Specialty Co.*

3,378,364, Neuville and Carroll, DEFOLIATION OF PLANTS; **4,166,733,** Donald N. Joy, CACODYLIC ACID-MONOSODIUM ACID METHANEARSONATE HERBICIDE COMBINATION, **filed** Aug. 11, 1982, D.C. Del. (Wilmington), Doc. 82-514, *Vineland Chemical Co.* v. *Vertac Chemical Corp.*

3,409,579, Ashland Oil & Refining Co., FOUNDRY BINDER COMPOSITION COMPRISING BENZYLIC ETHER RESIN, POLYISOCYANATE, AND TERTIARY AMINE; **3,485,797, same,** PHENOLIC RESINS CONTAINING BENZYLIC ETHER LINKAGES AND UNSUBSTITUTED PARA POSITIONS; **3,676,392,** Ashland Oil, Inc., RESIN COMPOSITIONS, **filed** Sept. 29, 1981, D.C., W.D. Pa. (Pittsburgh), Doc. 81-1663, *Combustion Engineering, Inc.* v. *Ashland Oil, Inc.*

3,425,429, Levolor Lorentzen, Inc., VENETIAN BLIND CONSTRUCTION SUITABLE FOR LOW HEADS AND NARROW SLATS; **3,425,480, same,** END BRACE ORGANIZATION FOR VENETIAN BLIND HEAD CHANNEL OR THE LIKE; **3,921,695, same,** WAND OPERATED VENETIAN BLIND, **filed** Aug. 25, 1982, D.C., S.D. Fla. (Miami), Doc. 82-1807-CIV-JLK, *Levolor Lorentzen, Inc.* v. *American Blind Corp., et al.*

3,425,480. **(See 3,425,479.)**

3,438,309. **(See 3,078,085.)**

3,452,719, USM Corp., MACHINE FOR APPLYING LOCKING PATCH TO THREADED ELEMENT; **3,554,258, same,** SELF-LOCKING THREADED ELEMENT; Reg. No. **907,426** (NYLOK), USM Corp., **filed** Sept. 7, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 5524, *Nylok Fastener Corp.* v. *N D Industries, Inc.*

3,474,639, Friedrich Refrigerators, Inc., AIR CONDITIONER CONTROL SYSTEM, **filed** Sept. 10, 1982, D.C., W.D. Tex. (San Antonio), Doc. SA82CA618, *Friedrich Air Conditioning & Refrigeration Co.* v. *General Electric Co.*

3,485,797. (See 3,409,579.)

3,494,297, Plasser and Theurer, MOBILE TRACK MAINTENANCE MACHINE; **4,066,020,** Josef Theurer, MOBILE TRACK TAMPING AND TRACK POSITION CORRECTION MACHINE, **filed** July 19, 1982, D.C. Del. (Wilmington), Doc. 82-459, *Jackson Jordan, Inc.* v. *Plasser American Corp.*

3,518,795, The Pangborn Corp., WORKPIECE TREATING APPARATUS, **filed** Nov. 17, 1982, D.C. Minn. (Minneapolis), Doc. 4-82 Civil 1513, *Kennecott Corp.* v. *Blast Cleaning Products Ltd.*

3,524,023, Milgo Electronics Corp., BANK LIMITED TELEPHONE LINE DATA COMMUNICATION SYSTEM; **3,619,503,** International Communications Corp., PHASE AND AMPLITUDE MODULATED MODEM; **3,783,194,** Milgo Electronics Corp., DATA MODEM HAVING A FAST TURNAROUND TIME OVER DIRECT DISTANCE DIALED NETWORKS, **filed** Aug. 17, 1982, U.S. Court of Appeals (First Circuit, Boston), Doc. 82-1644, *Codex Corp., et al.* v. *Milgo Electronics Corp., et al.* **Same, filed** Aug. 30, 1982, U.S. Court of Appeals (First Circuit, Boston), Doc. 82-1707, *Codex Corp., et al.* v. *Milgo Electronics Corp.*

3,546,796, Thomas M. Adams, SPECIAL SPORT SHOE FOR PEOPLE WITH HIGH INSTEPS; Reg. No. **1,072,741** (KAEPA), Kaepa, Inc.; Reg. No. **1,089,241** (DESIGN MISCELLANEOUS), Kaepa, Inc., **filed** Sept. 17, 1982, D.C., W.D. Tex. (San Antonio), Doc. SA82CA634, *Kaepa, Inc.* v. *Solo Serve, Inc.*

3,554,258. (See 3,452,714.)

3,586,423, Harry I. Zeltzer, METHOD OF IMPROVING COLOR DISCRIMINATION, **filed** Sept. 29, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5059, *X-Chrom Corp.* v. *Coast Contact Lens, Inc., et al.*

3,591,395, Zonsveld and Salmons, HYDRAULIC CEMENTITIOUS COMPOSITIONS REINFORCED WITH FIBRILLATED PLASTIC FILM; **3,645,961,** Solomon Goldfein, IMPACT RESISTANT CONCRETE ADMIXTURE, **filed** Dec. 8, 1982, D.C., N.D. Ga. (Atlanta), Doc. C82-2790A, *Synthetic Industries (Tex.), Inc. and Solomon Goldfein* v. *Forta Fibre, Inc., et al.*

3,593,854, Roy L. Swank, BLOOD TREATING AND FILTERING APPARATUS, **filed** Aug. 4, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4786, *Pioneer Viggo, Inc.* v. *Travenol Laboratories, Inc.*

3,596,275. (See 3,298,030.)

3,619,503. (See 3,524,023.)

3,635,297, Roger F. Salava, POSTAGE CALCULATOR, **filed** Nov. 19, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 4851, *Alvin Feder, et al.* v. *Triner Scale & Mfg. Co.* Order dismissed by agreement of the parties. Filed Nov. 12, 1981. **Same, filed** Jan. 27, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 0486, *J. Harold Winzeler* v. *Postalia, Inc.* **Same, filed** Oct. 18, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5385, *Roger F. Salava, et al.* v. *Mos Scale International, et al.*

3,644,023, Luciano Villani, SPRING LOADED SPECTACLE HINGE; **3,957,360, same,** SPECTACLE FRAMES WITH SPRING-LOADED HINGES, **filed** July 6, 1982, D.C.N.J. (Newark), Doc. 82-2178, *La Meccanoptica Leonardo S.p.A.* v. *Saflio S.p.A.* Stipulation and order dismissing action filed Oct. 21, 1982.

3,645,961. (See 3,591,395.)

3,646,748, PIC, Inc., TENDONS FOR PRESTRESSED CONCRETE AND PROCESS FOR MAKING SUCH TENDONS, **filed** Dec. 7, 1976, D.C. Del. (Wilmington), Doc. 76-432, *PIC, Inc.* v. *The Prescon Corp.* U.S. Pat. No. 3,646,748 is valid and was willfully infringed by Defendant, per order filed Aug. 13, 1982. **Same, filed** Sept. 7, 1982, D.C., W.D. La. (Shreveport), Doc. 82-2204, *Frederic A. Lang* v. *Pattridge Post-Tension, Inc.* **Same, filed** Sept. 13, 1982, D.C., S.D. Tex. (Houston), Doc. H-82-2657, *Frederic A. Lang* v. *U.S. Foundation Supply Co.* **Same, filed** Sept. 13, 1982, D.C., S.D. Tex. (Houston), Doc. H-82-2658, *Frederic A. Lang* v. *Post Tension of Tex., Inc.*

3,668,653, Fair, Baeverstad and Fisher, CONTROL SYSTEM, **filed** Mar. 23, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-70826, *White Consolidated Industries, Inc.* v. *Vega Servo-Control, Inc.* Pat. No. 3,668,653 is invalid under 35 U.S.C. §112. Final Judgment filed Aug. 18, 1982.

3,676,392. (See 3,409,579.)

3,703,718, Raytek, Inc., INFRARED INTRUSION DETECTOR SYSTEM, **filed** Aug. 23, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 4304, *Raytek, Inc.* v. *Aleph International Corp.*

3,761,994, SSK Enterprises, Inc., MAGNETIC TAPE HEAD CLEANING APPARATUS, **filed** Oct. 12, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5278, *SSK Enterprises, Inc.* v. *Kraco Enterprises, Inc.*

3,767,352, Husky Mfg. & Tool Works, Ltd., INJECTION MOLD WITH UNLOADING MECHANISM, **filed** Feb. 1, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-521-Kn, *Husky Injection Systems, Inc.* v. *Schnell Corp.* Action dismissed without prejudice on May 11, 1982.

3,771,023, Hollingsead and Pryor, AVIONIC TRAY AND DETACHABLE METERING PLATE CONTROLLING AIR FLOW TO AN ELECTRONIC INSTRUMENT WITH COOLING METERING PLATE, **filed** Sept. 29, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5072, *Hollingsead-International, Inc.* v. *Barry White Corp.*

3,775,752, John L. Lorenzo, JOB TIME RECORDING AND CALCULATING METHOD AND APPARATUS, **filed** July 20, 1982, D.C. Conn. (Bridgeport), Doc. B-82-429, *Computime, Inc.* v. *Compu-Timer.*

3,783,194. (See 3,524,023.)

3,806,312, McMaster and Nitschke, ROLLER HEARTH FURNACE; **3,994,711,** Harold A. McMaster, GLASS TEMPERING SYSTEM INCLUDING OSCILLATING ROLLER FURNACE, **filed** Mar. 19, 1982, D.C. Colo. (Denver), Doc. 82-C-438, *Glasstech, Inc.* v. *General Glass Corp.* All claims and counterclaims dismissed without prejudice per stipulation of dismissal filed Aug. 11, 1982.

3,811,544, Paul Maucher, CLUTCH WITH SPRING LOADED OPERATOR FULCRUM, **filed** Aug. 3, 1982, D.C. District of Columbia (Wash. D.C.), Doc. 82-2168, *Valeo, formerly Societe Anonyme* v. *Gerald J. Mossinghoff, et al.*

3,850,087, Creative Cookware, Inc., CREPE GRIDDLE FOR MAKING THIN UNIFORM CREPES, **filed** Sept. 5, 1980, D.C., S.D.N.Y., Doc. 80-Civ-5072, *Creative Cookware, Inc.* v. *Alfred E. Knobler & Co., Inc.* Action discontinued with leave to reopen in 30 days if settlement is not consumated. Filed Nov. 3, 1982.

3,857,774, Imperial Metal Industries (Kynoch) Ltd., CATHODES FOR ELECTROLYTIC CELL, **filed** May 27, 1982, D.C.N.J. (Newark), Doc. 82-1688, *Titani-*

um Industries v. *IMI Kynoch Ltd.* Order of dismissal of action filed Nov. 1, 1982.

3,862,861, McClelland & Devitt, MAINTENANCE-FREE TYPE LEAD ACID, **filed** Dec. 7, 1982, D.C. Colo. (Denver), Doc. 82-F-2088, *Gates Energy Products, Inc.* v. *Yuasa Battery Co., Ltd., et al.*

3,893,123, B.E. Industries, Inc., COMBINATION GYRO AND PENDULUM WEIGHT STABILIZED PLATFORM ANTENNA SYSTEM; **4,020,491, same,** COMBINATION GYRO AND PENDULUM WEIGHT PASSIVE ANTENNA PLATFORM STABILIZATION SYSTEM, **filed** Aug. 10, 1982, D.C., N.D. Calif. (San Francisco), Doc. C82 4197 WAI, *B.E. Industries, Inc.* v. *Sea Tel, Inc., et al.*

3,908,822, Bernard Giberstein, DEVICE FOR PACKAGING AND PRESENTATION OF KNITTED OR HOSIERY ARTICLES SUCH AS, MORE PARTICULARLY, STOCKINGS OR TIGHTS, **filed** Oct. 13, 1982, D.C., S.D.N.Y., Doc. 82-Civ-6783 VLB, *Dim Hosiery Corp.* v. *Leg Lines, Ltd., et al.*

3,921,695. (See 3,425,479.)

3,921,978, John E.C. Warren, GAME BAT; **3,923,304, same,** SURFACE BALL GAME AND APPARATUS, **filed** Oct. 6, 1982, D.C., E.D. Pa. (Philadelphia), Doc. 82-4399, *U.S. Games, Inc.* v. *R.B.C. Industries, Inc., et al.*

3,923,304. (See 3,921,978.)

3,935,105, Henry Filters, Inc., TUBULAR FILTER IN SETTLER, **filed** Aug. 17, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-73075, *Henry Filters, Inc.* v. *Filtra Systems Co.*

3,936,775, FEL Corp., MULTICAVITY DUAL MODE FILTER, **filed** Dec. 8, 1982, D.C., S.D.N.Y., Doc. 82-Civ-8160 LPG, *FEL Corp.* v. *Premier Microwave Corp.*

3,937,445, Vito Agosta, PROCESS AND APPARATUS FOR OBTAINING THE EMULSIFICATION OF NONMISCIBLE LIQUIDS, **filed** Sept. 8, 1982, D.C., M.D. Fla. (Jacksonville), Doc. 82-931-Civ-J-JHM, *Fuel Systems Design Corp.* v. *Hoffert Mfg. Co., Inc., et al.*

3,957,360. (See 3,644,023.)

3,958,313, Dukor Corp., METHOD, APPARATUS AND PRODUCT FOR IMPROVED PIPE-TO-MANHOLD SEALING, **filed** Oct. 22, 1982, D.C., N.D. Ind. (Fort Wayne), Doc. F81-0252, *Dukor Corp., et al.* v. *Press Seal Gasket Corp., et al.* Cause dismissed with prejudice on Sept. 16, 1982.

3,982,446, Andrew Van Dyken, CRUISE CONTROL APPARATUS FOR HAND GRIP THROTTLE CONTROL; **4,137,793,** William E. Sowell, THROTTLE CONTROL DEVICE FOR MOTORCYCLES AND THE LIKE; Reg. No. **1,107,169** (VANDA CRUISE), Vanda, Inc., **filed** July 16, 1981, D.C., W.D. Mich. (Grand Rapids), Doc. G81-505 CA1, *Andrew Van Dyken and Vanda, Inc.* v. *Sound-Off Safety Systems, Inc.*

3,982,446, Andrew Van Dyken, CRUISE CONTROL APPARATUS FOR HAND GRIP THROTTLE CONTROL; **4,137,793,** William E. Sowell, THROTTLE CONTROL DEVICE FOR MOTORCYCLES AND THE LIKE, **filed** July 16, 1981, D.C., W.D. Mich. (Kalamazoo), Doc. G81-506 CA1, *Andrew Van Dyken and Vanda, Inc.* v. *Maring Enterprises, Inc.* Stipulated Dismissal filed Feb. 23, 1982.

3,987,467, David W. Cowles, PHOTOGRAPHIC FILM IDENTIFICATION SYSTEM, **filed** Aug. 23, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 4322, *Shastar Corp.* v. *Technicolor, Inc.*

3,994,711. (See 3,806,312.)

3,995,443, Rudolf Iversen, AIR CONDITIONING SYSTEM, **filed** Oct. 13, 1982, D.C. Colo. (Denver), Doc. 82-F-1712, *Quantum Systems Corp., et al.* v. *Thermocycle International, Inc. and Rudolf Iversen.*

4,009,265, Alan N. Howard, METHODS AND FORMULATIONS FOR THE TREATMENT OF OBESITY; **4,298,601, same,** METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, **filed** July 2, 1982, Oreg. (Portland), Doc. 82-848, *Cambridge Plan International* v. *Rick Humphries, et al.*

4,020,491. (See 3,893,123.)

4,038,769, William A. Werner, PORTABLE SIGN HOLDER, **filed** Sept. 17, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-73488, *Sign-Up Corp.* v. *Marketing Displays, Inc.*

4,053,182, Rodney L. Nelson, MINING METHOD AND APPARATUS, **filed** Oct. 13, 1982, D.C., W.D. Pa. (Pittsburgh), Doc. 82-2149, *Nelson Energy Tooling, Inc.* v. *Fombell Fabricating & Welding, Inc., et al.*

4,059,868, Peter Meyn, APPARATUS FOR CUTTING OPEN A FOWL, **filed** Aug. 18, 1982, D.C., N.D. Ga. (Atlanta), Doc. C82-1784A, *Meyn, U.S.A., Inc.* v. *Cagles, Inc., doing business as Pritchard Sales Co.*

4,066,020. (See 3,494,297.)

4,073,565. (See 3,364,459.)

4,090,267, Casper Cuschera, SELF CAULKING TOILET DRAIN, **filed** Sept. 28, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-5020 CBM (Px), *Casper's Industries, Inc. and Casper Cuschera* v. *Anaheim Foundry Co., Inc.*

4,094,454, Sonoco Products Co., PARTITIONS WITH RELEASABLE GRIPPING EDGES, **filed** Sept. 27, 1982, D.C., S.D.N.Y., Doc. 82-Civ-6400 WK, *Four M Corp.* v. *Sonoco Products Co.*

4,106,963, Yealy and Abbott, METHOD OF MAKING AN ALL PLASTIC CAULKING CARTRIDGE, **filed** Oct. 26, 1982, D.C. S. Car. (Columbia), Doc. 82-2711-14, *Joseph L. Abbott* v. *General Electric Corp.*

4,126,546, Hjelmner and Larsson, METHOD FOR THE FILTRATION OF A SUSPENSION OR EMULSION; **4,197,201, same,** APPARATUS FOR THE FILTRATION OF A SUSPENSION OR EMULSION, **filed** Sept. 22, 1982, D.C. Md. (Baltimore), Doc. M-82-2781, *Parkson Corp., et al.* v. *Proto Circuits, Inc.*

4,137,793. (See 3,982,446.)

4,145,300, Sublistatic Holding S.A., DEVELOPERS CONTAINING MAGNETIC PARTICLES AND A SUBLIMABLE DYESTUFF; **4,246,331, same,** ELECTROPHOTOGRAPHIC DEVELOPERS CONTAINING SUBLIMABLE DYES; **4,251,611, same,** PROCESS FOR FORMATION OF PERMANENT IMAGE, **filed** May 27, 1981, D.C., E.D. Va. (Norfolk), Doc. 81-470-N, *Spectra Corp. and Sublistatic Holding S.A.* v. *Edward W. O'Brien, doing business as Powerband Products of Virginia.* Memorandum Order filed Dec. 8, 1982.

4,147,153, Smoky Mountain Enterprises, Inc., FIREPLACE AIR CIRCULATION AND DRAFT CONTROL; **4,185,610, same,** FORCED AIR CHANNEL BAFFLES; **4,230,093, same,** FIREPLACE DOOR; **4,301,783, same,** THREE WALL FORCED AIR HEATING UNIT; **D. 244,136, same,** STOVE; **D. 250,598, same,** STOVE; **D. 253,964, same,** COMBINED FIREPLACE ENCLOSURE AND STOVE, **filed** Dec. 23, 1981, D.C., N.D. Ga. (Gainesville), Doc. 81-163G, *Cebu Corp. and Smoky Mountain Enterprises, Inc.* v. *Fred L. Graves, et al.* All of the above patents are good and valid at law and were infringed by defendants. The complaint and counterclaim are hereby dismissed with prejudice. Filed Sept. 27, 1982.

4,166,733. (See 3,378,364.)

4,173,793. (See 3,982,446.)

4,176,921, Jan H. Matthias, EYEGLASSES HAV-

ING REMOVABLE LENSES, **filed** Aug. 11, 1982, D.C., S.D.N.Y., Doc. 82-Civ-5286, *Carrera International Corp.* v. *Colors in Optics, Ltd.* Final Consent judgment and permanent injunction filed on Sept. 13, 1982. **Same, filed** Oct. 7, 1982, D.C., S.D. Fla. (Miami), Doc. 82-2137-CIV-CA, *Carrera International Corp.* v. *Soccer Locker of Miami.*

4,185,610. (See 4,147,153.)

4,196,699, David C. Leeming, POULTRY DRINKER; **D. 218,831, same,** DRINKING TROUGH FOR POULTRY; **D. 219,778, same,** VALVE ASSEMBLY FOR POULTRY DRINKING DEVICE, **filed** Apr. 5, 1982, D.C. District of Columbia (Wash. D.C.), Doc. 82-0930, *Monoflo International, Inc.* v. *Broiler Equipment Ca., Ltd.* Consent judgment filed Aug. 17, 1982.

4,197,201. (See 4,126,546.)

4,222,803, Kent and Haines, METHODS OF MAKING FABRIC COVERED CEILING BOARD, **filed** July 28, 1982, D.C. Minn. (Minneapolis), Doc. 4-82 Civil 1063, *Conwed Corp.* v. *Armstrong World Industries, Inc.* Notice of Dismissal without prejudice filed by plaintiff on Sept. 9, 1982.

4,230,093. (See 4,147,153.)

4,240,193, Reuben Krein, METHOD OF STUFFING COMPRESSIBLE PRODUCTS INTO FLEXIBLE COVERS; **4,251,975, same,** METHOD AND APPARATUS FOR STUFFING CUSHIONS, MATTRESSES, AND THE LIKE; **4,272,874, same,** APPARATUS FOR STUFFING COMPRESSIBLE PRODUCTS INTO FLEXIBLE COVERS, **filed** Sept. 3, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV-81-4583-Kn (Gx), *BJK Industries, Inc.* v. *Roy C. Clements, et al.* Stipulation and order dismissing action without prejudice filed Aug. 2, 1982.

4,244,768, Weichowski, Miller and Kostner, METHOD OF MANUFACTURING A GRATING CONSTRUCTED OF RESIN BONDED FIBERS; **4,289,563, same,** GRATING CONSTRUCTION AND ASSEMBLY METHOD AND APPARATUS, **filed** Nov. 8, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5764, *Poly-Trusions, Inc.* v. *Harsco Corp.*

4,246,331. (See 4,145,300.)

4,250,620, Masatoshi Nishikawa, PLASTIC SCISSORS WITH METALLIC CUTTING INSERTS, **filed** Oct. 18, 1982, D.C. Conn. (Bridgeport), Doc. B-82-614, *Kingshead Corp.* v. *Acme United Corp.*

4,251,611. (See 4,145,300.)

4,251,975. (See 4,240,193.)

4,272,874. (See 4,240,193.)

4,278,414, Kennedy Sky-Lites, Inc., APPARATUS FOR MAKING PLASTIC SKYLIGHTS, **filed** Sept. 16, 1982, D.C., M.D. Fla. (Orlando), Doc. 82-469-ORL-CIV-R, *Sun Tek Ind., Inc.* v. *Kennedy Sky-Lites, Inc., et al.*

4,289,563. (See 4,244,768.)

4,298,601, Alan N. Howard, METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, **filed** Aug. 13, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 4126 (AAH), *Cambridge Plan International* v. *Towne, Paulsen & Co., Inc.* **Same, filed** Oct. 1, 1982, D.C. Hawaii (Honolulu), Doc. 82-0567, *Cambridge Plan International* v. *Hawaii Diet Plan, Inc.* **Same, filed** Oct. 12, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5298, *Cambridge Plan International* v. *Richlife, Inc.* **Same, filed** Oct. 12, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5299, *Cambridge Plan International* v. *Winning Laboratories.* **Same, filed** Nov. 8, 1982, D.C. Del. (Wilmington), Doc. 82-725, *Cambridge Plan International* v. *Forever Slender, Inc.*

4,298,601. (See 4,009,265.)

4,298,901, Weintraub and Oblinger, RESISTIVE CONTROLLER, **filed** Oct. 14, 1982, D.C., S.D. Fla. (Fort Lauderdale), Doc. 82-8446-CIV-JAG, *Water Sentry, Inc.* v. *K-Rain Mfg. Corp., et al.*

4,301,783. (See 4,147,153.)

D. 195,254. (See 3,151,503.)

D. 218,831. (See 4,196,699.)

D. 219,778. (See 4,196,699.)

D. 226,342, Frank J. Curran, ASH TRAY OR SIMILAR ARTICLE, **filed** June 10, 1982, D.C., M.D. Tenn. (Nashville), Doc. 82-3528, *Frank J. Curran Co.* v. *New World Imports, Inc.* **Same, filed** Sept. 21, 1982, D.C., N.D. Ind. (Hammond), Doc. H 82-0668, *Frank J. Curran* v. *Tri-State Hospital Supply Corp.* **Same, filed** Nov. 3, 1982, D.C., E.D. Mich. (Flint), Doc. 82-40440, *Tri-State Hospital Supply* v. *Frank J. Curran Co.*

D. 244,136. (See 4,147,153.)

D. 250,598. (See 4,147,153.)

D. 251,292, Coachmen Industries, Inc., TOP FOR AN AUTOMOTIVE VAN, **filed** Feb. 5, 1982, D.C., N.D. Ind. (South Bend), Doc. S82-0025, *Coachmen Industries, Inc.* v. *Richard Nardi, et al.* D. 251,292 is deemed valid. Consent Judgment filed July 28, 1982.

D. 251,797, Anderson and Clayton, STOVE, **filed** Jan. 21, 1980, D.C. New Mexico (Albuquerque), Doc. 80-066JB, *John I. Andersen, doing business as Andersen Manufacturing* v. *Terry Frasure, et al.* Judgment entered in favor of plaintiff and against defendant on Nov. 5, 1982.

D. 253,964. (See 4,147,153.)

D. 255,065, Frank S. Salacuse, COMPARTMENTED TRAY FOR STORING COSMETICS AND THE LIKE, **filed** Sept. 13, 1982, D.C., S.D.N.Y., Doc. 82-Civ-6077-WCC, *The Glumen Group Ltd.* v. *Stance Industries, Inc., et ano.*

D. 263,130, Alberto Vitaloni, REAR VIEW MIRROR, **filed** Apr. 30, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 2718, *Imos Italia* v. *Interpart Corp.* **Same, filed** Aug. 4, 633333D.C., N.D. Calif. (San Francisco), Doc. C82 4142 WAI, *Imos Italia, et al.* v. *Grand Auto, Inc.*

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U. S. DEPARTMENT OF THE AIR FORCE

SN 6-436,869. FABRICATION OF GALLIUM ARSENIDE-GERMANIUM HETEROFACE JUNCTION DEVICE.

SN 6-433,561. STALL ELIMINATION AND RESTART ENHANCEMENT DEVICE.

SN 6-437,655. A PROCESS FOR THE EPITAXIAL DEPOSITION OF III-V COMPOUNDS UTILIZING A CONTINUOUS IN-SITU HYDROGEN CHLORIDE ETCH.

SN 6-431,865. BANDPASS FILTER FORMED BY SERIAL GRATINGS OPERATING IN A WOOD'S ANOMALY REGION.

SN 6-439,492. SECTOR AIRFLOW VARIABLE GEOMETRY COMBUSTOR.

SN 6-431,434. NICKEL-CADMIUM BATTERY CONDITIONER AND TESTER APPARATUS.

SN 6-434,647. COMBUSTION CHAMBER FLOATWALL PANEL ATTACHMENT ARRANGEMENT.

SN 6-439,471. TOTAL INTERNAL REFLECTION MODULATOR/DEFLECTOR.

SN 6-431,435. MOUNTING CONSTRUCTION FOR TURBINE VANE ASSEMBLY.

SN 6-429,939. A METHOD FOR THE PARTICLE SIZE INDEPENDENT SPECTROMETRIC DETERMINATION OF METAL PARTICLES IN LUBRICATING OILS AND HYDRAULIC FLUIDS.

SN 6-433,597. SIMPLE NONRESTRICTIVE ARM RESTRAINT SYSTEM.

SN 6-435,515. MULTIPLE THERMOCOUPLE TESTING DEVICE.

SN 6-434,671. OPTICAL SYSTEM FOR MEASURING SHADOWGRAPH DATA.

SN 6-435,522. IMAGING APPARATUS FOR TRANSVERSE ELECTRO-OPTIC TUNABLE FILTER.

SN 6-206,412. (4,358,949) ARGON PURITY TESTER.

SN 6-169,020. (4,358,925) TEMPERATURE SENSING ASSEMBLY.

SN 6-265,719. (4,359,568) POLYAROMATIC AMIDES CONTAINING 1,3-BUTADIENE UNITS.

SN 6-206,415. (4,359,650) HIGH VOLTAGE DRIVER AMPLIFIER APPARATUS.

SN 6-176,436. (4,359,261) FIBER OPTIC SWITCHING DEVICE.

SN 6-329,459. (4,359,360) APPARATUS FOR SELECTIVELY JET ETCHING A PLASTIC ENCAPSULATING AN ARTICLE.

SN 6-676,442. (4,357,611) RADAR CROSS SECTION AUGMENTATION.

SN 6-192,163. (4,357,796) SMALL GAS TURBOFAN ENGINE WITH REGENERATING DIFFUSER.

SN 6-307,991. (4,359,567) THERMOOXIDATIVELY STABLE ARTICULATED P-BENZOBISOXAZOLE AND P-BENZOBISTHIAZOLE POLYMERS.

SN 6-293,776. (4,359,190) EXACT INVOLUTE PLY PATTERNS.

SN 6-171,916. (4,360,910) DIGITAL VOICE CONFERENCING APPARATUS IN TIME DIVISION MULTIPLEX SYSTEMS.

SN 6-144,819. (4,359,259) HOLOGRAPHIC MULTIPLEXER/DEMULTIPLEXER.

SN 6-100,321. (4,359,199) SOFT LANDING GEAR.

SN 6-304,126. (4,365,034) ACETYLENE-TERMINATED POLYIMIDE COMPOSITIONS.

SN 6-256,881. (4,365,173) PHASE SHIFTER ADJUSTMENT APPARATUS.

SN 6-181,924. (4,359,399) TAGGANTS WITH EXPLOSIVE INDUCED MAGNETIC SUSCEPTIBILITY.

U. S. DEPARTMENT OF THE ARMY

SN 6-408,316. FINLESS GUN-FIRED PRACTICE ROUND.

SN 6-415,956. RADIO FREQUENCY COUPLED DIFFERENTIAL SENSOR COIL FOR IMPROVED MUZZLE VELOCITY MEASUREMENTS.

SN 6-444,136. QUASI-OPTICAL MILLIMETER WAVE POWER COMBINER.

SN 6-445,341. AN AUTOMATIC LAYOUT PROGRAM FOR HYBRID MICROCIRCUITS (HYPAR).

SN 6-294,106. COMPOSITE RESIST STRUCTURES FOR SUBMICRON PROCESSING IN ELECTRON/ION LITHOGRAPHY.

SN 6-414,690. SHAPED CHARGE WARHEAD CONSTRUCTION.

SN 6-409,750. A FIRING TIME SELECTOR FOR PRECISION WEAPON AIMING.

SN 6-449,029. MULTIPLEXED NOISE CODE GENERATOR UTILIZING TRANSPOSED CODES.

SN 6-432,218. COMPOUNDS AND METHOD FOR DETECTING THIOLS.

SN 6-441,718. RADIOCHROMIC LEUKO DYE REAL TIME DOSIMETER, ONE WAY OPTICAL WAVEGUIDE.

SN 6-434,792. ROLLER BEARING GEAR SYSTEM.

SN 6-454,806. METHOD OF FREQUENCY TRIMMING SURFACE ACOUSTIC WAVE DEVICES.

SN 6-449,947. VEHICLE INTERIOR DEICING/DEFOGGING SYSTEM.

SN 6-445,799. DIELECTRIC WAVEGUIDE FERRITE MODULATOR/SWITCH.

SN 6-445,800. INTERFERENCE CANCELLING SYSTEM FOR A MOBILE SUBSCRIBER ACCESS COMMUNICATIONS SYSTEM.

SN 6-418,325. APPARATUS FOR MEASURING PROJECTILE'S TRANSVERSE DISPLACEMENT AT GUN MUZZLE.

SN 6-446,922. RADAR TARGET ANGLE MEASURING SYSTEM.

SN 6-429,756. HIGH-ENERGY-BEAM-HARDENED ARMOR PLATE.

SN 6-408,317. BALLISTIC PROJECTILE.

SN 6-445,333. MULTIPATH INTERFERENCE REDUCTION SYSTEM.

SN 6-264,268. (4,369,937) HINGING AND LATCHING APPARATUS.

SN 6-953,292. (4,369,811) NULL BALANCING FOR FLUIDIC SENSORS AND AMPLIFIERS.

SN 6-221,737. (4,370,655) COMBINED SIDE LOBE CANCELLER AND FREQUENCY SELECTIVE LIMITER.

SN 6-224,603. (4,370,597) THYRATRON SWITCH FOR NARROW PULSES.

U. S. DEPARTMENT OF AGRICULTURE

SN 6-448,675. MODIFIED STARCHES AS EXTENDERS FOR ABSORBENT POLYMERS.

SN 6-409,266. PROCESS FOR RENDERING HOLLOW TEXTILE FIBERS TEMPERATURE-ADAPTABLE TO VARIOUS THERMAL ENVIRONMENTS.

U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-422,304. TRUNK DYNAMOMETER.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 15, 1983

4,174,411	4,335,198	4,355,570	4,364,502
4,191,686	4,337,253	4,356,412	4,364,520
4,199,040	4,338,827	4,356,962	4,364,692
4,203,077	4,344,271	4,357,438	4,364,943
4,243,740	4,345,002	4,358,377	4,364,983
4,246,857	4,345,776	4,358,794	4,365,044
4,254,268	4,346,163	4,358,884	4,365,178
4,276,543	4,346,384	4,359,043	4,365,236
4,289,879	4,346,562	4,359,272	4,365,395
4,293,865	4,346,728	4,359,315	4,365,544
4,294,639	4,347,231	4,359,558	4,365,656
4,294,912	4,347,273	4,360,037	4,366,273
4,296,356	4,347,470	4,360,274	4,366,384
4,298,605	4,348,357	4,360,292	4,366,509
4,299,622	4,348,409	4,360,299	4,366,548
4,299,994	4,348,422	4,360,661	4,366,553
4,301,503	4,349,316	4,360,695	4,366,628
4,309,213	4,350,031	4,360,875	4,366,652
4,311,830	4,350,705	4,361,267	4,366,821
4,315,712	4,350,972	4,361,328	4,366,822
4,316,245	4,351,005	4,361,648	4,366,958
4,316,327	4,352,031	4,361,697	4,367,241
4,318,935	4,352,811	4,361,816	4,368,028
4,319,056	4,352,960	4,362,143	4,368,039
4,325,871	4,353,087	4,362,725	4,368,900
4,327,172	4,354,157	4,363,464	4,368,907
4,332,689	4,355,105	4,363,539	4,369,219
4,332,788	4,355,309	4,364,327	
4,334,188	4,355,506	4,364,454	

Disclaimers

3,602,695.—*Bruce Boss,* Dallas, Tex. DOCUMENT CODING METHOD AND APPARATUS. Patent dated Aug. 31, 1971. Disclaimer filed Jan. 5, 1983, by the assignee, *Docutel Corp.*

Hereby enters this disclaimer to all claims of said patent.

3,682,130.—*William D. Jeffers,* Fresno, Calif. FUSIBLE TEMPERATURE RESPONSIVE TRIGGER DEVICE. Patent dated Aug. 8, 1972. Disclaimer filed Dec. 2, 1982, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby enters this disclaimer to claims 3 and 4 of said patent.

3,761,682.—*Thomas R. Barnes,* Dallas, *George R. Chastain,* Irving and *Don C. Wetzel,* Dallas, Tex. CREDIT CARD AUTOMATIC CURRENCY DISPENSER. Patent dated Sept. 25, 1973. Disclaimer filed Jan. 5, 1983, by the assignee, *Docutel Corp.*

Hereby enters this disclaimer to claims 1–9 and 37–39 of said patent.

3,833,885.—*Fred J. Gentle,* and *Jack Chu-Wang Chang,* Dallas, Tex. AUTOMATIC BANKING SYSTEM. Patent dated Sept. 3, 1974. Disclaimer filed Jan. 5, 1983, by the assignee, *Docutel Corp.*

Hereby enters this disclaimer to claims 16–20 of said patent.

3,971,656.—*Erwin Rudy,* Beaverton, Oreg. SPINODAL CARBONITRIDE ALLOYS FOR TOOL AND WEAR APPLICATIONS. Patent dated July 27, 1976. Disclaimer filed June 22, 1982, by the assignee, *Teledyne Industries, Inc.*

The term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

4,170,726.—*Hiroji Okuda,* Kitakatsuragigun, Japan. METHOD OF WORKING OUTER PERIPHERY OF ARTICLES WITH LASER LIGHT. Patent dated Oct. 9, 1979. Disclaimer filed Dec. 21, 1982, by the assignee, *Koyo Seiko Co. Ltd.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,313,189.—*William G. McGuffin,* Willingboro, N.J. STYLUS POSITION SENSOR FOR VIDEO DISC PLAYER APPARATUS. Patent dated Jan. 26, 1982. Disclaimer filed Dec. 13, 1982, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Dedication

4,007,282.—*Otto Mauz,* Liederbach, Taunus, and *Ernold Granzer,* Kelkheim, Taunus, Germany. LOWERING LIPID AND SUGAR LEVELS IN THE BLOOD WITH A BIS(4-HYDROXYPHENYL) ALKANOIC ACID OR ESTER THEREOF. Patent dated Feb. 8, 1977. Dedication filed June 4, 1982, by the assignee, *Hoechst Aktiengesellschaft.*

Hereby dedicates said patent to the Public.

Disclaimers and Dedications

Des. No. 236,290.—*Samuel L. McNair,* Overland Park, Kans. ELECTRIC HAIR CURLING IRON. Patent dated Aug. 12, 1975. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Dazey Products Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Des. No. 238,672.—*Samuel L. McNair,* Overland Park, Kans. HAND HELD SHOWER SPRAY HEAD. Patent dated Feb. 3, 1976. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Dazey Products Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Des. No. 240,560.—*Henry J. Talge,* Leawood, and *James M. Gerdom,* Overland Park, Kans. HYDROTHERAPY UNIT FOR BATH TUBS. Patent dated July 13, 1976. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Whirl-O-Matic Corp.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

3,846,848.—*Samuel L. McNair,* Overland Park, Kans. CONTROL ASSEMBLY FOR BATHTUB HYDROTHERAPY UNIT. Patent dated Nov. 12, 1974. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Dazey Products Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries, except the Cleveland Public Library, offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 25, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-06-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-31-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-15-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-30-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	2-13-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-20-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	1-09-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-05-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-20-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during December 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,221,339 to 3,226,728, inclusive

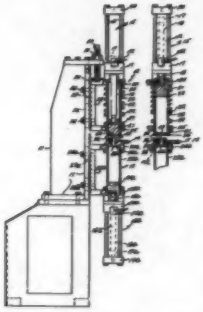
Plant Patents ..... Numbers 2,577 to 2,584 inclusive

REEXAMINATIONS

March 15, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 3,634,973 (59th)
APPARATUS FOR ABRADING BY EXTRUSION AND ABRADING MEDIUM
Ralph W. McCarty, Monroeville, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.
Reexamination Request No. 90/000,060, Aug. 25, 1981.
Reexamination Certificate for Patent No. 3,634,973, issued Jan. 18, 1972, Ser. No. 853,430, Aug 27, 1969.
U.S. Cl. 51/2R **Int. Cl.³ B24B 27/00**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1, and 5–7 is confirmed.

Claim 4, having been finally determined to be unpatentable, is cancelled.

Claim 2 is determined to be patentable as amended.

Claim 3, dependent on an amended claim, is determined to patentable.

1. The method of honing a surface comprising passing over the surface to be honed in abrasive contact therewith a semi-solid, difficulty flowable plastic material permeated with finely divided abrasive particles while holding said plastic material confined in pressure contact with said surface.

B1 4,099,219 (60th)
CORONODE TENSIONING AND SUPPORT ARRANGEMENT
Jean Wilcox Laing, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Reexamination Request No. 90/000,112, Nov. 19, 1981.
Reexamination Certificate for Patent No. 4,099,219, issued Jul. 4, 1978, Ser. No. 751,827, Dec. 17, 1976.
U.S. Cl. 361/230 **Int. Cl.³ H01T 19/04.**

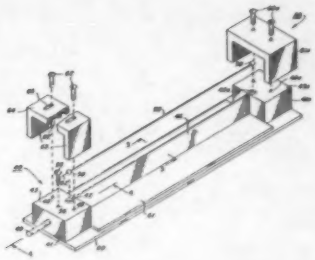
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 2 is cancelled.

Claims 1, 3 and 4 determined to be patentable as amended.

Claims 5–7, dependent on amended claims, are determined to be patentable.

1. A corona discharge device comprising a coronode including a wire coated with a dielectric material, and means for applying a tension force directly to said dielectric material to aid in supporting said coronode [.], *said means including end block assemblies for supporting opposed ends of said coronode, said coronode having an enlarged*



mass carried by said material adjacent one end thereof, at least one of said assemblies including means movable into abutment with said mass to provide apply a preselected tension thereto.

B1 3,931,088 (61st)
ADHESIVE COMPOSITION CONSISTING OF POLYVINYLALCOHOL SOLUTION OR POLYVINYLACETATE LATEX MODIFIED WITH HYDROPHOBIC SOLUTION OF ISOCYANATE COMPOUND
Seiichi Sakurada, Shimizu; Yasuaki Miyazaki, Hino; Tatsuaki Hattori; Makoto Shiraishi, both of Toyama; Taisei Inove, Mitaka, all of Japan; assignors to Kuraray Co., Ltd., Kurashiki; Asahi Co., Ltd.; Koyo Sangyo Co., Ltd., both of Tokyo, all of Japan
Reexamination Request No. 90/000,102, Nov. 5, 1981.
Reexamination Certificate for Patent No. 3,931,088, issued Jan. 6, 1976, Ser. No. 384,542, Aug. 1, 1973.
U.S. Cl. 524/197 **Int. Cl.³ C08L 29/04; 23/36**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2 and 6–8, having been finally determined to be unpatentable, are cancelled.

Claims 3, 4, and 5 are determined to be patentable as amended.

New claims 9–41 added and determined to be patentable.

9. *A water-resistant adhesive composition comprising (1) a first mixture of an aqueous solution of polyvinyl alcohol in which the polyvinyl alcohol is present in an amount ranging from 5 to 20 weight percent of said aqueous solution, and an aqueous emulsion of a vinyl acetate polymer and/or an aqueous latex of a butadiene polymer* [in which the polyvinyl alcohol is present in an amount ranging from 5 to 20 weight percent of said first mixture] *and (2) a second mixture of an isocyanate compound and a solvent selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, halogenated hydrocarbons, ketones, ethers, esters and mixtures thereof, said solvent being less than 5 weight percent soluble in water and water being less than 5 weight percent soluble in said solvent at a temperature between 20° and 30° C.,* [said solvent having a boiling point higher than 200° C.,] *and said solvent being present in an amount ranging from 10 to 400 weight percent of said isocyanate compound.*

REISSUES

MARCH 15, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

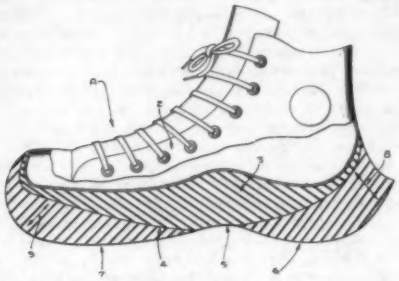
Re. 31,173
SPORTING SHOE

Alexander C. Daswick, 647 Orange Grove, South Pasadena, Calif. 91030

Original No. 4,030,213, dated Jun. 21, 1977, Ser. No. 728,211, Sep. 30, 1976. Application for reissue Aug. 17, 1979, Ser. No. 67,362

Int. Cl.³ A43B *13/12, 5/00*

U.S. Cl. 36—30 R **3 Claims**



1. A sporting shoe comprising:

an upper housing;

a relatively rigid sole disposed beneath and secured to said housing [, the bottom surface of said sole being convexly arcuately curved in a longitudinal direction so that its longitudinal center portion provides a pedestal, whereby when a runner wearing the shoe lands upon a running surface with the heel portion of said sole the runner's foot and the shoe will then roll forward in a pivotal movement about said pedestal];

a first resilient auxiliary sole member secured to the heel portion of said rigid sole; and

a second resilient auxiliary sole member secured to the toe portion of said rigid sole; *and*

the bottom surface of said rigid sole being convexly arcuately curved in a longitudinal direction so that its longitudinal center portion provides a pedestal;

whereby when a runner wearing the shoe lands upon a running surface by engaging same with said first auxiliary sole member, the runner's foot and the shoe will then roll forward in a pivotal movement about said pedestal.

Re. 31,174
FUEL INJECTION SYSTEM

Harro Herth, Schwieberdingen; Bernd Kraus, Stuttgart; Wilfried Sautter, Ditzingen, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 4,073,269, dated Feb. 14, 1978, Ser. No. 605,852, Aug. 19, 1975. Application for reissue Sep. 12, 1979, Ser. No. 75,066

Int. Cl.³ F02D *3/00*

U.S. Cl. 123—489 **2 Claims**

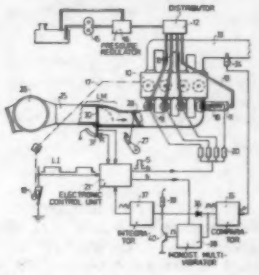
7. A fuel-air control system for an internal combustion engine, including a controller with integral control characteristic for controlling the fuel-air mixture admitted to the engine (λ-control process) and including

(A) an oxygen sensor, located in the exhaust system of the engine, and capable of providing an output signal; the improvement in said fuel-air system comprising:

(B) a comparator circuit, for comparing said output signal from said oxygen sensor with a reference value and providing an output signal;

(C) an integrating circuit, whose sole control signal input is connected to the output from said comparator circuit and which delivers a changeable output signal;

(D) a timing circuit connected to the output from said comparator circuit and which delivers an output signal that in addition to the output of the comparator circuit is continuously connected to the input of said integrating circuit, the output signal from said timing circuit inhibits the transmission of said output signal from said comparator to said integrating



circuit for delaying the change of its output signal in one direction for a predetermined period of time thereby delaying in one direction the response of said integrating circuit to changes in the output signal from said oxygen sensor;

(E) a control unit, connected to the output from said integrating circuit, for providing injection valve control signals;

(F) an air-fuel rate adjusting device connected to said control unit; and

(G) an air flow-rate meter capable of providing an output signal which is connected to said timing circuit to determine the duration of said predetermined time period.

Re. 31,175
MEANS AND METHODS FOR SENDING HEAT DOWNWARDLY

Edward J. O'Hanlon, Assembly Point, Lake George, N.Y. 12845

Original No. 4,089,366, dated May 16, 1978, Ser. No. 744,166, Nov. 22, 1976. Application for reissue Mar. 12, 1980, Ser. No. 116,545

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.22 **5 Claims**

4. A heat transfer assembly for transferring heat in a downward direction from a first position to a second, vertically lower position, and comprising:

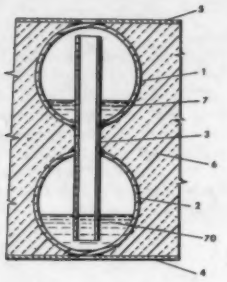
a pair of hollow containers formed of heat transfer material, a first of said containers positioned substantially vertically above a second of said containers, said first container including an aperture through a vertically lower wall portion aligned with a further aperture through a vertically upper wall portion of said second container;

a conduit having a first end portion extending into said first container through said aperture, said conduit having a second end portion extending into said second container through said further aperture;

a first heat transfer member in conductive heat transfer relationship with a vertically upper wall portion of said first container for conveying heat into said first container;

a second heat transfer member in conductive heat transfer

relationship with a vertically lower wall portion of said second container for conveying heat from said second container; and a quantity of liquid refrigerant material partially filling at least one of said containers; and,



insulative means surrounding said first and second containers and a portion of said conduit extending therebetween for preventing heat from leaving said assembly between said first heat transfer member and said second heat transfer member.

Re. 31,176

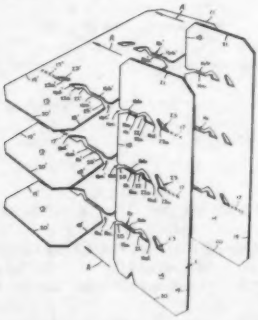
CARTON DIVIDER

Wallace O. Raubenheimer, Lebanon, N.J., assignor to Jefferson Smurfit Incorporated, Alton, Ill.

Original No. 4,103,818, dated Aug. 1, 1978, Ser. No. 780,517, Mar. 23, 1977. Application for reissue Jul. 21, 1980, Ser. No. 170,591

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—15 **21 Claims**



1. A collapsible carton divider having at least one substantially planar partition and one substantially planar cross-partition interlocked therewith along an imaginary line of intersection between their respective planes, each said partition and cross-partition having parallel and opposite first and second edges and partition interlock means for interlocking with each partition which interlocks therewith, each said partition interlock means comprising means defining an open-ended slot having opposite side edges extending inwardly from said first edge thereof and being spaced apart a distance which is substantially greater than the thickness of the partition and a closed-end thereof located intermediate said first and second edges of the partition, a surface portion aligned with said slot and which determines, and extends beyond, said closed end of the latter towards said second edge of the partition, means defining a locking tab projecting from one of said side edges of said slot and [providing] *having length extending along an intermediate portion of said slot length to provide* a first abutment edge facing away from the open end of said slot *and extending adjacent, and laterally with respect to said imaginary line of intersection between the planes of the interlocked partitions,* and means defining a tab-receiving opening within said surface portion and providing a second abutment edge [aligned with said first abutment edge and also] facing away from the open end of said slot, said surface portion on each of [said] *the* interlocked partitions being received in said slot of its interlocked partition and said locking tab on each of said interlocked partitions being received in said tab-receiving opening of its interlocked partition, said interlocked partitions being pivotable in either direction along all of said lines of intersection whereby said divider may be pivoted from an open condition thereof defined by a substantially angular disposition of each said partition with [resepct] *respect* to each said interlocked cross-partition to either of two collapsed conditions thereof depending upon the direction of said pivoting from said open condition, either of said collapsed conditions being defined by a substantially adjacent and parallel disposition of each said partition with respect to each said interlocked cross-partition, [said *the* first abutment edges on the respective of said partitions respectively abutting [said] *the* second abutment edges on the respective of said interlocked partitions when said divider is in [either] *a first* of its said collapsed conditions and in its said open condition, said tab-receiving opening of each said partition further providing a tab-retainer edge aligned with said one side edge of said slot from which said locking tab projects, *each said tab-receiving opening having a configuration including respective opposite side edge portions each extending away from said tab-retainer edge to receive said locking tab of its said interlocking partition and guide the same into abutment with said tab-retainer edge as said partition and cross-partition are being interlocked, the direction of each of said opposite side edge portions being both away from said imaginary line of intersection in the direction of lateral projection of said locking tab and towards said first edge of said partition, said second abutment edge being adjacent to said tab-retainer edge,* the distance of projection of said locking tab on each of said partitions being substantially greater than the thickness of the partition whereby said locking tabs overlap the respective of said tab-retainer edges of said tab-receiving openings with which said locking tabs are respectively associated when said divider is collapsed in one direction to [a] *said* first of said two collapsed conditions thereof, all of said locking tabs in their said overlapping positions then being on the same side of said divider, and whereby disengagement of said interlocked partitions by movement of one with respect to another in either direction along any of said lines of intersection is substantially prevented when said divider is in both its said first collapsed condition and its said open condition.

Re. 31,177

APPARATUS FOR MAKING PLATES FOR PRINTING

Masahiro Kogiso, 1-31-16, Fujimoto, Kokubunji-shi, Tokyo; Minehiro Sakata, 546 Yokokawa-cho, Hachioji-shi, Tokyo; Hatsuo Oda, and Tamio Iwamoto, both of 3-20-10, Tamadaira, Hino-shi, Tokyo, all of Japan

Original No. 4,114,999, dated Sep. 19, 1978, Ser. No. 740,086, Nov. 9, 1976. Application for reissue Dec. 8, 1978, Ser. No. 967,775

Claims priority, application Japan, Nov. 14, 1975, 50-137457; Mar. 26, 1976, 51-37098[U]; Mar. 26, 1976, 51-37099[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **17 Claims**

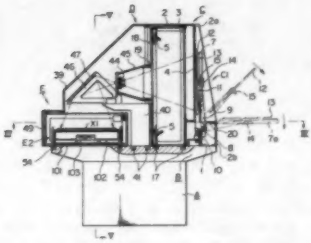
2. An *electro-fax type of* apparatus [according to claim 1,] *for making a plate for offset printing, comprising:*

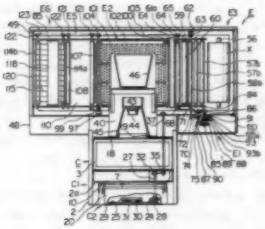
a manuscript table section comprising a first housing having a vertical exposure window formed in the front thereof, a manuscript table unit mounted on the front side of said first housing and adapted to cover said exposure window and to be laid down on the front side of said exposure window so that a manuscript is placed face upward thereon and, then, set face backward at said exposure window and lamp means accom-

modated in said first housing for illuminating said exposure window;

an optical system section comprising a second housing, a projection lens accommodated in said second housing and located in the rear of said exposure window to project the picture of the manuscript in the backward direction, and a mirror accommodated in said second housing and located in the rear of said projection lens to reflect the projected picture in the downward direction, and;

a master paper processing system section comprising a third housing and a system accommodated in said third housing for processing a master paper to be made into said plate, said





master paper-processing system comprising a plurality of components including a paper feeding mechanism, an electrically charging device, an exposure station located directly under said mirror, a wet developing device and a drying and discharging device, said components being so arranged that said master paper is forwarded along a substantially straight path extending in a horizontal plane and in a lateral direction to the apparatus which is perpendicular to the direction of the optical axis of said projection lens;

wherein said sections are formed into units, respectively, which are separable from one another, and said apparatus further comprises bed means for supporting said sections to be in association with each other.

Re. 31,178

WHEELCHAIR LIFT

Scott C. Deacon, Agoura, Calif., assignor to Ricon Corporation, Sun Valley, Calif.

Original No. 3,913,759, dated Oct. 21, 1975, Ser. No. 406,254, Oct. 15, 1973. Application for reissue Oct. 20, 1977, Ser. No. 843,767

Int. Cl.³ B60P *1/48*

U.S. Cl. 414—546 **12 Claims**

12. A lift mountable in a vehicle adjacent an access opening thereof, for use in moving an object such as a wheelchair to and from a generally horizontal bed of the vehicle, comprising:

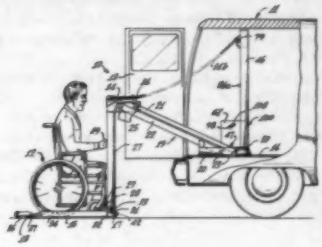
a pair of parallelogram linkages each having a base link mountable in the vehicle adjacent the access opening, two elongated arms pivotally mounted on said base link for swinging about spaced, parallel axes between upright positions in the vehicle and outwardly extending, lowered positions, and an end link pivotally mounted on the ends of said arms opposite said base link;

said linkages being spaced apart for mounting in the vehicle for swinging in substantially parallel planes;

a platform for holding the object;

means pivotally connecting one edge portion of said platform to both of said end links for moving said one edge along an arc passing close to the end of the bed at the access opening;

drive means for selectively swinging the arms of said linkages from said lowered positions to said upright positions and back



and further coupled for tilting the platform into a vertical storage position about an axis generally along the one edge of the platform after the elongated arms of said linkages have reached the upright position;

control means for actuating said drive means and for stopping said linkages in each direction of movement with said platform in an intermediate position level with the bed, for movement of a wheelchair into and out of the vehicle; and

means for preventing downward tilting of said platform from a preselected angular position, but permitting upward tilting into the storage position.

Re. 31,179

METHOD OF PROCESSING WASTE SLUDGE FROM WET PHOSPHORIC ACID PURIFICATION FACILITIES

Peter Meurer, Herdecke-Ende; Martin Hater; Fritz Meininghaus, both of Dortmund, and Rüdiger Scheel, Schwerte, all of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Original No. 4,257,898, dated Mar. 24, 1981, Ser. No. 99,530, Dec. 3, 1979. Application for reissue Aug. 3, 1981, Ser. No. 289,378

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854433

Int. Cl.³ C02F *1/00*

U.S. Cl. 71—25 **6 Claims**

1. A method of converting a waste sludge of substantially no utility from wet phosphoric acid purification, having a relatively high, water-soluble phosphatic content and containing other environmental-polluting components, to a useful fertilizer, said method comprising contacting said sludge with steelworks slag having a relatively low phosphatic content, forming a fertilizer admixture from said sludge and slag having an averaged phosphatic content depending on the relative proportions of sludge and slag used, and reducing the concentration of said other environmental-polluting components to a non-polluting, permissible value.

Re. 31,180

QUATERNARY SPINODAL COPPER ALLOYS

John T. Plewes, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 4,052,204, dated Oct. 4, 1977, Ser. No. 685,263, May 11, 1976. Application for reissue Jul. 6, 1981, Ser. No. 280,539

Int. Cl.³ C22C *9/02, 9/06;* C22F *1/08*

U.S. Cl. 148—412 5 Claims

1. Cold worked and aged spinodal copper alloys consisting essentially of nickel in an amount of from 2–20%, tin in an amount of from 2–8%, an additional element selected from the group consisting of Fe in an amount of from 2 to 15%[, Zn in an amount of from 2 to 10%,] and Mn in an amount of from 2 to 15%, and remainder copper.

4. Cold-worked and aged spinodal copper alloys consisting essentially of nickel in an amount of from 2–20%, tin in an amount of from 2–8%, at least one additional element selected from the group consisting of Zr in an amount of from 0.05–0.2%, Nb in an amount of from 0.1–0.3%, Cr in an amount of from 0.5–1%, Al in an amount of from 0.5–1.5%, and Mg in an amount of from 0.5–1%, and remainder copper.

Re. 31,181

MEANS AND METHOD FOR IMPROVING NATURAL DEFENSES AGAINST CARIES

Israel Kleinberg, 14 Three Pond Rd., Smithtown, N.Y. 11787

Original No. 4,154,813, dated May 15, 1979, Ser. No. 868,933, Jan. 12, 1978. Continuation-in-part of Ser. No. 697,538, Jun. 18, 1976, abandoned. Application for reissue Jun. 23, 1980, Ser. No. 162,102

Int. Cl.³ A61K *9/68, 7/16, 7/18, 7/22, 37/00;* C07C *103/52*

U.S. Cl. 424—88 9 Claims

1. A method for supplementing the body's resistance to caries which comprises providing to the mouth an effective amount of a caries combatting pH rise factor which is [a peptide] *a source of pH adjusting compound or precursor thereof* having 2–4 amino acid units at least one of which is arginine.

Re. 31,182

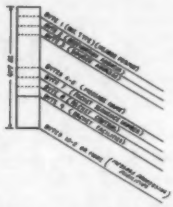
PACKET-SWITCHED DATA COMMUNICATION SYSTEM

William C. Crager, West Islip; Sudhindra R. Umarji, New York, both of N.Y.; Robert H. Griffin, Montclair, N.J., and Gerard J. Louit, Mamaroneck, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Original No. 4,058,672, dated Nov. 15, 1977, Ser. No. 740,681, Nov. 10, 1976. Application for reissue Oct. 11, 1979, Ser. No. 84,016

Int. Cl.³ H04L *11/20;* H04N *1/32*

U.S. Cl. 178—3 31 Claims



1. A packet-switched data communications *and storage* system *for transmitting messages from a plurality of source terminals to one or more destination terminals, said source and destination terminals being of like or different operating characteristics,* comprising:

means for [receiving message information from one or more message sources;] *subdividing each of said messages from said source terminals into one or more data packets having at least an information portion and a destination terminal address portion for transmitting said message to one or more addressed destination terminals, each of said messages including a priority assignment;*

means for [subdividing said message information from each of said message sources into a plurality of data packets, each of said packets including at least a portion of said message information;] *providing a plurality of switching nodes in a network for transmitting said data packets to said destination terminals over said network through said switching nodes;*

means for [independently transmitting said data packets over said communications system including a network of a plurality of switching nodes for selectively storing and forwarding said packets over said network in accordance with information contained by said packets; and] *selectively storing and forwarding on a priority basis data packets that are received at any of said switching nodes from a plurality of source terminals to one or more destination terminals based on the priority assigned to said message; and*

[processing means for storing said data packets for reassembly of said packets into said message information] *means coupled to said destination terminals for reassembling said data packets into said transmitted messages before receipt at said destination terminals to which said messages are addressed.*

PLANT PATENTS

GRANTED MARCH 15, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,990
ROSE PLANT—JACSUN

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 3, 1981, Ser. No. 298,960
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of compact plant, yellow buds and blooms, small foliage that is resistant to mildew and a mild daisy-like fragrance.

4,991
ROSE PLANT

A. Patrick C. Dickson, Newtownards, Northern Ireland, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 11, 1981, Ser. No. 301,382
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its heavily branched, upright miniature plant bearing orange colored buds opening to pink mature flowers with no fragrance, and its resistance to rose powdery mildew.

4,992
ROSE PLANT

Jan Van Veen, Aalsmeer, Netherlands, assignor to Carlton Rose Nurseries, Inc., Carlton, Oreg.

Filed Aug. 31, 1981, Ser. No. 297,743
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—21 1 Claim

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from a seed parent of the Ilona class and an unnamed pollen parent characterized by its ability to yield large long lasting blooms on a continuous basis in a greenhouse which maintain true color from bud through petal drop, substantially as shown as described.

4,993
ROSE PLANT

Samuel D. McGredy, P.O. Box 14100, Panmure, Auckland, New Zealand

Filed Jul. 15, 1981, Ser. No. 283,539
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as shown and described, characterized particularly by large (5 to 12 bloom) sprays of flowers of unusual coloration combining carmine petal coloring and light colored petal edges and flower centers.

4,994
PISTACHIO TREE

Henry P. Anderson, and Kenneth L. Puryear, both c/o Pioneer Nursery, 800 N. Chester, Bakersfield, Calif. 93308

Filed Jul. 27, 1981, Ser. No. 286,884
Int. Cl.³ A01H 5/03
U.S. Cl. Plt.—30 1 Claim

1. A new and distinct variety of pistachio tree, identified as PN-46-M, characterized by a mature tree of rounded, spreading shape, wider than tall, having several main branches without central leader; rapid growth, abundant, leathery, healthy foliage, ease of propagation by budding or grafting; and further characterized by the abundant production of male flowers, in clusters, which produce pollen especially desirable for pollenizing a selected variety of female pistachio tree identified as PN-17-F for the production of hybrid seeds, said hybrid seeds producing a fast growing, disease resistant tree of value for use as understock upon which to bud or graft commercial nut bearing varieties of pistachio such as 'Kerman'.

4,995
BOUGAINVILLEA SELECTION

Clifton C. Comstock, Glendora, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jun. 22, 1981, Ser. No. 275,867
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct selection of Bougainvillea as substantially shown and described, a selection characterized by a superior combination of unusually large and vibrant purple colored flower bracts and a deeper and more colorful purple pubescent new growth.

4,996
ILEX PLANT—MESCHICK VARIETY

Kathleen K. Meserve, St. James, N.Y., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 25, 1981, Ser. No. 277,331
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—65 1 Claim

1. A new and distinct variety of Ilex, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a vigorous, dense and attractive upright pyramidal evergreen shrub,

(b) dull, scarlet fruit which is produced in good quantity in the spring and which attains its full scarlet coloration in mid to late fall, lasting on the bush into late winter or early spring of the following year,

(c) cold tolerance which is superior to varieties of *Ilex aquifolium* and equal to, if not superior to varieties of *Ilex pernyi* as evidenced by the fact that the new variety has survived with little to no visible damage temperatures of −15° F. with winds of over 30 miles per hour,

(d) foliage which is primarily ovate-quadrangular in shape and less glossy in appearance than that of *Ilex aquifolium* and which is smaller and much more jagged than such species, and which is approximately 50 percent larger and more jagged than that of *Ilex pernyi*, and

(e) a striking plant growth habit which is characterized by forming a symmetrical narrow pyramid to a much greater degree than either of its parents and other seedlings of this cross.

4,997
CHRYSANTHEMUM PLANT

Keith Linstott, Bognor Regis, England, assignor to Frampton's Nurseries Limited, Chichester, England

Filed Jul. 14, 1980, Ser. No. 168,543
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—80 1 Claim

1. A new and distinct variety of *Chrysanthemum morifolium* bailey of the pink open terminal spray type, substantially as herein shown and described, characterized particularly as to novelty by unique improved color, especially during high light and temperature periods, a strong uniform spray, a long growing season, and flowers resistant to bruising and damping.

4,998

ASPARAGUS PLANT JERSEY CENTENNIAL

J. Howard Ellison, Milltown, N.J., assignor to Research Corporation, New York, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,779
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct hybrid variety of asparagus plant substantially as herein shown and described, characterized particularly as to novelty by the unique combination of very substantially increased yield, over prior known varieties, good field tolerance to root rot (*Fusarium oxysporium*) and crown rot (*F. moniliforme*), with decided ability to maintain these characteristics in different geographic areas and still produce similarily with the tolerances and resistance to rust being maintained at those wide spread geographic areas, and the commercially valuable aspects provided thereby.

4,999

ASPARAGUS PLANT NO. 22

J. Howard Ellison, Milltown, N.J., assignor to Research Corporation, New York, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,858
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of male asparagus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of rust resistance (*Puccinia asparagi*), good field tolerance to root rot (*Fusarium oxysporum*) and crown rot (*F. moniliforme*), its ability to produce edible spears and to be combined with a female plant to produce hybrid seed which will produce plants having useful production characteristics.

PATENTS

GRANTED MAR. 15, 1983

ERRATA

For CLASS	See PATENT NO.
445–028	4,376,328
604–387	4,376,440
436–502	4,376,634
501–097	4,376,652
549–268	4,376,733
429–062	4,376,809
429–090	4,376,810
429–101	4,376,811
377–063	4,376,897
382–044	4,376,932

PATENTS

GRANTED MARCH 15, 1983

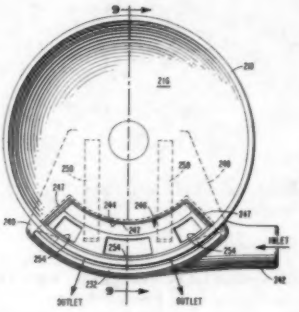
GENERAL AND MECHANICAL

4,376,312

HYDRAULICALLY ACTUATED CARDIAC PROSTHESIS

Thomas C. Robinson; Sotiris Kitrilakis, both of Berkeley, and Thomas B. Martin, Jr., Oakland, all of Calif., assignors to Foxcroft Associates, San Antonio, Tex.

Filed May 19, 1981, Ser. No. 265,199
Int. Cl.³ A61F 1/24; A61M 1/03
U.S. Cl. 3—1.7 34 Claims



1. An implantable hydraulic actuation system for supplying motive power to a blood pumping chamber having a flexible portion comprising:

an actuation fluid reservoir;

actuation fluid pumping means in fluid communication with said reservoir for providing intermittent pulses of actuation fluid;

an actuation chamber having an actuation fluid inlet path in fluid communication with said pumping means, and a separate actuation fluid outlet path in fluid communication with said reservoir; said actuation chamber being adapted to cause displacement of the flexible portion of said blood pumping chamber in response to changes in volume of actuation fluid in said actuation chamber and said actuation chamber further including a manifold and a flow gate intercommunicating the interior of said manifold and the interior of said actuation chamber through which actuation fluid passes when filling said actuation chamber, said actuation fluid inlet and outlet paths being formed in the wall of said manifold; and

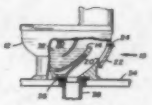
valve means associated with said actuation chamber adapted to close or open said actuation fluid outlet path primarily in response to forces which vary as a function of actuation fluid flow through said actuation fluid inlet path, said valve means comprising a closure member disposed within and partially blocking said flow gate, said closure member being movable within said flow gate between a closed position blocking said actuation fluid outlet and an open position clear of said actuation fluid outlet, and spring means biasing said closure member toward its open position, whereby said closure member is movable to its closed position at the beginning of each fluid pulse when the differential pressure force across said closure member exceeds the magnitude of the force of said spring means.

4,376,313

ACCESS PORT FOR A COMMODE

Charles J. Morgan, 917 S. Charles St., Baltimore, Md. 21230

Filed Mar. 2, 1981, Ser. No. 239,328
Int. Cl.³ E03D 11/00
U.S. Cl. 4—255 10 Claims



1. An access means for clearing obstructions from inaccessible areas of a passageway through a structure, comprising:

a partially enclosed structure, said structure having enclosing walls and a passageway therethrough, said passageway having enclosing walls, a portion of said passageway enclosing walls being in common with said enclosing walls of said partially enclosed structure, said passageway having inaccessible areas to the exterior of said passageway and said enclosure structure;

an aperture, said aperture being located in said portion of said passageway enclosing walls in common with said enclosing walls of said partially enclosed structure, said aperture communicating with the interior of said passageway in the vicinity of said inaccessible areas and the exterior of said passageway and concurrently the exterior of said partially enclosed structure, said aperture having a recessed shoulder therearound at the exterior surface of said passageway enclosing walls;

a cover means, said cover means being configured to removably fit over and close said aperture, said cover means fitting into said recessed shoulder around said aperture, said cover means having a raised portion thereon, said raised portion being on the inward surface of said cover means, said raised portion being configured to fit into said aperture leading into said passageway;

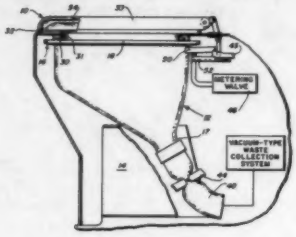
a seal means, said seal means being removably located in said recessed shoulder around said aperture, said seal means thereby being between said cover means and said recessed shoulder, said seal means being positioned and extending around the periphery of said aperture;

a fastening means, said fastening means affixing said cover means to said partially enclosed structure, said fastening means thereby clamping said seal means between said cover means and said recessed shoulder and concurrently effectively closing and sealing said aperture.

4,376,314
VEHICULAR TOILET

Robert C. Iwans, Simsbury, Conn., assignor to Kidde, Inc., Belleville, N.J.

Filed Jun. 12, 1981, Ser. No. 273,189
Int. Cl.³ E03D 11/00; B60R 15/04
U.S. Cl. 4—431 6 Claims



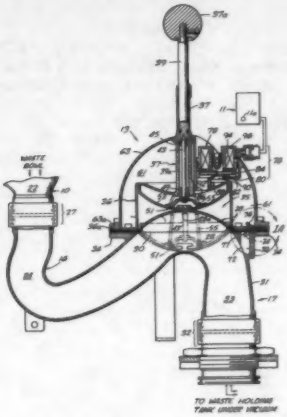
1. A vehicular toilet comprising
a toilet bowl having an upper rim defining a bowl opening and a lower outlet,
means for selectively controlling the application of a vacuum to said bowl outlet for flushing the toilet,
flush ring means proximate said toilet bowl rim having aperture means for directing liquid downwardly onto the inner surface of said bowl during flushing,
means for increasing the cleaning effectiveness of the liquid as it flows downwardly over the toilet bowl during flushing including
means for sealing said toilet bowl opening,
manifold means having air inlet aperture means and air outlet aperture means communicating with the interior of said toilet bowl above said flush ring means, and
means for directing the air pulled into said bowl from said air manifold during flushing downwardly over the liquid discharged from said flush ring means.

4,376,315
VACUUM FLUSH VALVE

Everett H. Badger, Irvine, and Michael J. Rogerson, Newport Beach, both of Calif., assignors to Rogerson Aircraft Controls, Irvine, Calif.

Division of Ser. No. 68,131, Aug. 20, 1979, Pat. No. 4,275,470.
This application Jun. 29, 1981, Ser. No. 278,259
Int. Cl.³ E03D 11/00
U.S. Cl. 4—431 19 Claims

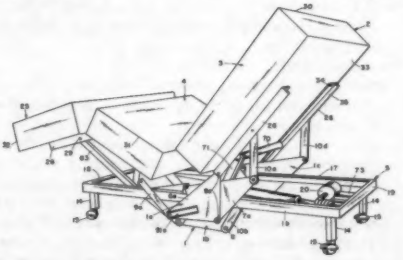
1. A valve of a design suitable for incorporating into a drain including:
a. a flexible diaphragm movable between a closed position within said drain to seal the same shut, whereby vacuum is isolated downstream of the diaphragm and cabin pressure is equalized upstream of said diaphragm and an open position out of said drain line so that the vacuum is applied through said valve and to said bowl to remove the waste therein and flushing liquid therefrom,
b. means forming a vacuum/pressure operated control chamber sealed across said diaphragm on the side opposite said drain for opening the diaphragm and flush valve by applying vacuum to said side and for closing said valve by applying pressure to said opposite side,
c. a source of vacuum for operating said control chamber, and
d. valve means for normally connecting said control chamber to cabin pressure so that the valve is closed across the drain by the combined action of cabin pressure on that opposite side of said diaphragm and vacuum applied to the downstream side of the diaphragm across the drain, and for intermittently connecting the control chamber to said source of vacuum to cause the diaphragm to said source of vacuum to cause the diaphragm to be pulled into an open position out of the drain.



4,376,316
HINGE FOR ADJUSTABLE BEDS AND THE LIKE

Mark F. Mercier, Stevens Point, and Frank M. Damico, Neenah, both of Wis., assignors to Joerns Furniture Company, Stevens Point, Wis.

Filed Dec. 31, 1980, Ser. No. 221,795
Int. Cl.³ A61G 7/00
U.S. Cl. 5—66 27 Claims



1. In an adjustable bed having a mattress, and first and second mutually articulated mattress support sections, the improvement of a hinge comprising:
a first plate pivotally connected with one of said mattress support sections at a first point on said plate; said first point being disposed on said first plate at a preselected location, whereby said plate is disposed generally below said one mattress support section; said first plate having second and third pivotal connection points, spaced apart from said first point and each other, and disposed generally below said first point; said third point being positioned on said plate at a location spaced laterally from a straight, imaginary line connecting said first and second points;
a second plate pivotally connected with the other one of said mattress support sections at a first point on said second plate; the first point of said second plate being disposed at a preselected location thereon, whereby said second plate is disposed generally below said other mattress support section; said second plate having second and third pivotal

connection points, spaced apart from the first point of said second plate and each other, and disposed generally below said second plate first point; the third point of said second plate being positioned thereon at a location spaced laterally apart from a straight, imaginary line connecting the first and second points of said second plate;

a first link having one end thereof pivotally connected with said one mattress support section, and the other end pivotally connected with the third point of said second plate;

a second link having one end thereof pivotally connected with said other mattress support section, and the other end pivotally connected with the third point of said first plate; and

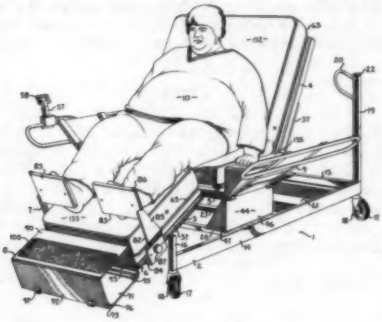
means for pivotally interconnecting said first and second plates at said second pivotal connection points, whereby one of said mattress support sections is rotatable with respect to the other mattress support section about an axis of rotation disposed generally above said mattress support sections and adjacent to the center of said mattress to alleviate compressing that portion of said mattress disposed between said two mattress support sections.

4,376,317

FOLDABLE STEP ARRANGEMENT FOR BEDS

Bruce L. Johnston, Shawnee, Kans., assignor to Burke, Inc., Mission, Kans.

Filed Jul. 6, 1981, Ser. No. 280,807
Int. Cl.³ A61G 7/06
U.S. Cl. 5—80 **10 Claims**



1. An adjustable bed comprising:

(a) a ground engaging frame;

(b) a mattress support including a head section, a center section, and a foot section, each section being pivotally interconnected and having opposite sides;

(c) said center section being mounted to said frame with said head and foot sections swingably attached to said center section for respective relative raising and lowering; and

(d) a foldable step arrangement mounted to said foot section and having floor supported legs and a patient supportive upper surface; said step arrangement including means providing automatic unfolding into a use position as said foot section lowers and providing automatic folding into a nonuse position as said foot section raises.

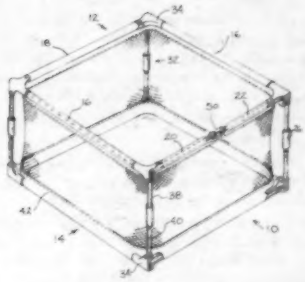
4,376,318

PORTABLE PLAYPEN

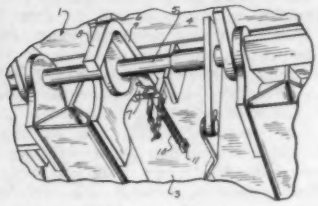
John R. Cirillo, 226 Kohr Rd., Kings Park, N.Y. 11754

Filed Feb. 19, 1980, Ser. No. 122,662
Int. Cl.³ A47D 7/01, 13/06
U.S. Cl. 5—99 C **2 Claims**

1. A portable, foldable playpen (10) comprising upper (12) and lower (14) frames, each having a plurality of side (16) and end (18) members pivotally interconnected (34) with each other side (16) and end (18) members of said upper (12) frame positioned vertically above corresponding side (16) and end (18) members of said lower (14) frame, a flexible enclosure (42) attached to members of said frames, and vertical members (32) having pivotally interconnecting means with the pivotal interconnections (34) of the side (16) and end (18) members of said upper (12) and lower (14) frames, the inner ends of sections (38, 40) of the vertical members (32) and the inner ends of sections (20, 22) of the end members (18) in each of said upper (12) and lower (14) frames having pivotally interconnecting means (24, 50) for permitting, in cooperation with the upper (12) and lower (14) frames and the pivotal interconnections (34) of the vertical members (32), said upper (12) and lower (14) frame end (18) members and said vertical members (32) to be collapsed into substantially parallel and abutting arrangements relative to each other and relative to side (16) members, the pivotally interconnected means (24) of the vertical members with the pivotal interconnections (34, 50) of the side (16), end (18) members and vertical members (32) comprising locking and interlocking means for preventing the collapsing of the upper (12) and lower (14) frame end (18) members, until the pivotal interconnections (24) are collapsed, wherein when in an unfolded condition said upper (12) and lower (14) frames lying in substantially parallel planes with side (16) and end (18) members of the upper (12) frame aligned vertically with the respective side (16) and end (18) members of the lower (14) frame and the side (16) and end (18) members of the upper (12) and lower (14) frames being positioned orthogonally to the vertical members (32) to form an enclosed play area with said flexible enclosure (42), and when in a folded condition the pivotal interconnections (34) of the upper (12) and lower (14) frames side (16) and end (18) members with the vertical members (32), in cooperation with the pivotally interconnected inner ends of sections (20, 22) of the end (18) members in each of the upper (12) and lower (14) frames permit each of said upper (12) and lower (14) frame end (18) members to be collapsed into substantially parallel and abutting arrangements relative to each other and relative to side (16) members, and the pivotal interconnections (34) of the upper (12) and lower (14) frame side (16) and end (18) members with vertical members (32), in cooperation with the pivotally interconnected inner ends of sections (38, 40) of the vertical members (32) permit the side (16) members of each of the upper (12) and lower (14) frames not having any pivoting interconnections to be positioned substantially parallel to and in abutting arrangements relative to each other and relative to end (18) members and vertical members (32) to form a compact arrangement with said flexible enclosures (42).

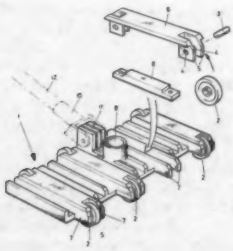


4,376,319
MAINTENANCE LIP LOCK
Robert C. Bedford, Milwaukee, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.
Filed Apr. 23, 1981, Ser. No. 256,693
Int. Cl.³ E01D 1/00
U.S. Cl. 14—71.3 10 Claims



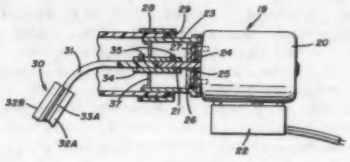
7. A maintenance assembly for a dockboard having a ramp and a lip hinged to the forward edge of the ramp and movable between a pendant position and an extended position, comprising a bracket connected to the under surface of the ramp; a lip supporting member slidably contained in said bracket, said lip supporting member being movable between a stored position wherein said lip supporting member is disposed beneath the ramp and an operative position wherein said lip supporting member engages the under surface of the lip to lock the lip in the extended position; biasing means connected to said lip supporting member and urging said lip locking member to said stored position; and locking means connected to said lip supporting member and engageable with said bracket to lock said lip locking member in said operative position.

4,376,320
VACUUM CLEANER HEAD FOR SUBMERGED SURFACES
Fabio B. V. Linda, Transvaal, South Africa, assignor to Poolquip Industries (Proprietary Limited), Johannesburg, South Africa
Filed Nov. 12, 1981, Ser. No. 320,843
Claims priority, application South Africa, Nov. 18, 1980, 80/7154
Int. Cl.³ F04H 3/20
U.S. Cl. 15—1.7 5 Claims



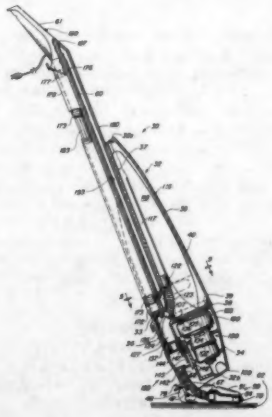
1. A vacuum cleaner head for use on submerged surfaces, the head comprising
a generally planar body,
an opening through the body to which a vacuum source can be connected,
upstanding flanges on the body,
fittings mounted on the body and located between the flanges,
axle mounting holes through the fittings,
axles mounted in the holes, and
wheels journalled on the axles,
the axles being secured in place in the holes by the flanges on either side of the fittings, and the wheels being arranged to support the body above a submerged surface.

4,376,321
AUTOMATIC DRAIN CLEAN OUT DEVICE
Jack Dudley, 2784 Beck St., Warren, Ohio 44484
Filed May 20, 1981, Ser. No. 265,380
Int. Cl.³ B08B 9/02
U.S. Cl. 15—104.3 SN 3 Claims



1. An automatic drain clean out device comprising a longitudinally extending flexible snake, oppositely disposed longitudinally extending integral fins on said snake, oppositely disposed longitudinally extending ribs on said snake positioned between said fins, means for positioning said snake in a drain pipe and rotating the same therein, a bifurcated fitting in said drain pipe, a seal in a portion of said fitting, said means for positioning and rotating said snake being rotatable in said fitting and extending through said seal, said oppositely disposed longitudinally extending ribs being less flexible than said fins.

4,376,322
SUCTION CLEANER
Scott N. Lockhart, Normal; Samuel E. Hohulin, Lexington, both of Ill., and Joseph F. Brooks, deceased, late of Bloomington, Ill. (by Elva M. Brooks, executrix), assignors to National Union Electric Corporation, Greenwich, Conn.
Continuation of Ser. No. 77,545, Sep. 21, 1979, abandoned, which is a continuation of Ser. No. 870,994, Jan. 20, 1978, abandoned. This application Sep. 25, 1980, Ser. No. 190,702
Int. Cl.³ A47L 9/00
U.S. Cl. 15—323 34 Claims



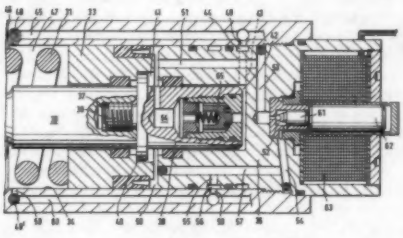
1. In a suction cleaner adapted for either on-the-floor or above-the-floor cleaning and including a housing having suction-generating means therein and floor nozzle means adapted to be moved over a rug or carpet to be cleaned, conduit means

connecting said floor nozzle means with said suction-generating means, said housing also having an auxiliary inlet communicating with said suction-generating means, a suction hose having one end connected to said auxiliary inlet to permit above-the-floor cleaning, and elongated handle means connected to said housing for manipulating said floor nozzle means over a rug or carpet to be cleaned, the improvement of a recess in said handle means for receiving said hose, and retaining means including magnetic means adapted to coact with magnetically attractable material in said hose to exert a magnetic force on the magnetically attractable material in said hose and tending to hold said hose in nested relation in said recess when said hose is not in use.

4,376,323
AUTOMATIC DOOR CLOSER

Horst Tillmann, Ennepetal, Fed. Rep. of Germany, assignor to Dorma-Baubeschlag GmbH & Co. KG, Ennepetal-Voerde, Fed. Rep. of Germany

Filed Jan. 15, 1981, Ser. No. 225,404
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001406
Int. Cl.³ E05F 3/04
U.S. Cl. 16—51 **9 Claims**

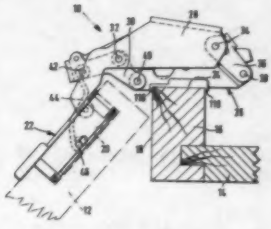


1. An automatic door closer comprising an elongated fluid-filled housing having a closed end and an opposite open end; a plug closing said open end of said housing; a first piston reciprocatably arranged in said housing and dividing the latter into a first pressure space adjacent said closed end and a second pressure space adjacent said plug; a closer shaft adapted to be connected to a door, extending transverse to the elongation of said housing and being turnably mounted in said housing in the region of said closed end; means connecting said closer shaft with said first piston for moving the latter, during turning of the closer shaft in door-opening direction, in a first direction reducing the volume of said first pressure space while increasing the volume of said second pressure space, said piston-moving means comprising a piston rod slidingly guided in said first piston and having a free end facing said plug, said plug being formed with a blind bore coaxially with said piston rod and having an open end facing the latter; spring means cooperating with said first piston for biasing the latter in a second direction opposite to said first direction; a second piston fixed to the free end of said piston rod and extending into said blind bore; first throttled passage means communicating at one end with said first pressure space and at the other end with the cylinder space formed between the closed end of said blind bore and the facing end of said second piston; second throttled passage means communicating at opposite ends respectively with said first and said second pressure space; and valve means in said second throttled passage means movable between a closed position preventing flow of fluid through said second passage means and an open position permitting flow of fluid through said second passage means.

4,376,324
FURNITURE HINGE

Horst Lautenschläger, Reinheim; Gerhard Lautenschläger, Brensbach-Wersau, and Karl Lautenschläger, Jr., Reinheim, all of Fed. Rep. of Germany, assignors to Mepla, Inc., High Point, N.C.

Filed Nov. 26, 1980, Ser. No. 210,614
Claims priority, application Austria, Sep. 26, 1980, 4841/80
Int. Cl.³ E05D 7/04
U.S. Cl. 16—236 **12 Claims**



1. An articulated hinge for pivotally connecting a door flap to the carcass of a piece of furniture which has spaced carcass walls and a frame, said frame facing the door and extending essentially at right angles to the carcass walls and confining a free door opening, said door flap in closed position partially overlapping said frame, said hinge comprising: a carcass-related part adapted to be connected to the edge surface of the frame offset inwardly relative to the adjacent carcass wall, and a door-related part pivotally connected to the carcass-related part via a link mechanism and adapted to be connected to the door flap, said door-related part being in the form of an insert cup adapted to be inserted fittingly into a recess in the backside of the door flap facing the piece of furniture, said insert cup comprising a connecting part adapted to be fittingly inserted into said recess and a link carrier part adapted to interlock at least partially with said connecting part, said link carrier part having a portion interlocking with said connecting part, said interlocking portion being displaceable at right angles with respect to the pivot axis of the hinge parallel to the backside of the door flap by a predetermined measure, said link carrier interlocking portion also being adapted to be connected on said door flap within said predetermined measure in random relative displacement positions.

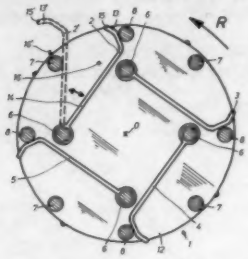
4,376,325
SURFACE CLEANING DEVICE FOR CARCASSES

Peter F. Boss, Roskilde, and Olfert H. Petersen, Lejre, both of Denmark, assignors to Slagteriernes Forskningsinstitut, Roskilde, Denmark

PCT No. PCT/DK79/00038, § 371 Date Jun. 20, 1980, § 102(e) Date Jun. 19, 1980, PCT Pub. No. WO80/00779, PCT Pub. Date May 1, 1980
PCT Filed Oct. 18, 1979, Ser. No. 194,395
Claims priority, application Denmark, Oct. 20, 1978, 4676/78
Int. Cl.³ A22B 5/08
U.S. Cl. 17—18 **6 Claims**

1. A surface cleaning device for removing undesirable offals, in particular glands, loose membranes, veins, blood vessels and blood, from the muscles of carcasses and/or hair and bristles from the rind thereof, said device comprising a wheel rotating about an axis during operation and having a plurality of peripherally and axially spaced rigid cleaning fingers, each finger having a free engagement end provided with cleaning means, such as scraper and grinding means, for removing undesirable offals, each of said cleaning fingers being mounted on the wheel to be freely pivotable about a pivot axis which is parallel with the axis of rotation of the wheel and is spaced from said axis; and stop means for limiting the pivoting movement of

each cleaning finger under the action of centrifugal force, said stop means being so disposed that an outermost active position



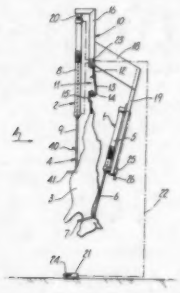
of the cleaning finger is placed a substantial pivot distance from the pivoted position the cleaning finger would assume in case of unlimited pivot under the action of centrifugal force.

4,376,326

APPARATUS FOR FLAYING OF SMALL CATTLE, ESPECIALLY SHEEP CARCASSES, IN SLAUGHTERING

Terje Noroy, Tronerudvn, Norway, assignor to Hamjern A/S, Hamar, Norway

Filed Jul. 8, 1981, Ser. No. 281,310
Claims priority, application Norway, Jul. 11, 1980, 802104
Int. Cl.³ A22B *5/16*
U.S. Cl. 17—21 **9 Claims**



1. An apparatus for flaying of small cattle, especially sheep carcasses, in slaughtering, the sheep carcasses being suspended from the hind legs, e.g. in an overhead conveyor, said apparatus comprising a stretching device which is arranged to be connected with a forward part of the carcass and to exert a downward-directed stretching force thereon, and a flayer driving device with a flayer arranged for reciprocating movement along the ventral side of the carcass, said flayer being designed for introduction into a pocket formed in advance by manual flaying of a ventral portion of the carcass, and for executing flaying by movement along the ventral side from said pocket.

4,376,327

WATER POWERED SAUSAGE STUFFER

David C. Curtis, 400 W. Palatine Rd., Arlington Heights, Ill. 60004

Filed Jan. 29, 1981, Ser. No. 229,344
Int. Cl.³ A22C *11/06*
U.S. Cl. 17—39 **4 Claims**

1. A water powered sausage stuffing apparatus comprising:

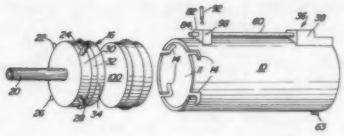
(a) an enlarged, horizontally disposed cylinder, open at one end and closed at the other end, an inlet port adjacent said closed end;

(b) a flat cylindrical cover having a side wall for closing the open end of said cylinder and means to removably secure the cover to the open end of said cylinder and an elongated tube secured to said cover axially thereof and extending outwardly therefrom and having communication with the interior of said cylinder;

(c) a piston disposed in said cylinder and movable therein;

(d) means to control house water under pressure to the interior of said cylinder and behind said piston; and

said means to control the water comprises a pair of spaced housings positioned on top of said cylinder, one positioned adjacent said open end and the other adjacent the closed end of said cylinder, each housing having a longitudinal through opening therein, an elongated rod shiftable in the openings having a forward end and a rear tapered end, a pair of large and small cylindrical offsets in said rod adja-



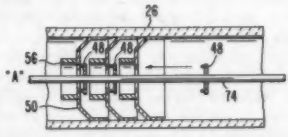
cent the rear end of said rod, said housing adjacent said closed end of said cylinder having bottom, side and end walls, an elongated channel in said bottom wall having communication with said inlet port in said cylinder at one end thereof, a second port having communication with the opposed end of said channel and having communication with the longitudinal opening in said rear housing and said offsets, a bore in the larger offsets, said tapered end having an axial opening therein communicating with said bore, a water inlet in the side wall of said housing having communication with the area around said small offset and said bore by the longitudinal shifting of said rod, an oval shaped bore in said housing positioned adjacent said open end of said cylinder, a cylindrical bore in said rod having communication with said oval bore, a handle rod having a ball on one end positioned in said oval shaped bore and said ball frictionally seated in said cylindrical bore, movement fore and aft of said handle rod to shift said rods fore and aft to position said offsets relative to said water inlet.

4,376,328

METHOD OF CONSTRUCTING A GASEOUS LASER

Wayne S. Mefferd, Los Altos Hills, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed May 4, 1981, Ser. No. 259,912
Int. Cl.³ H01S *3/00*
U.S. Cl. 445—28 **14 Claims**



1. A method of fabricating a gaseous laser discharge tube comprising:

assemblying a plurality of spaced-apart heat-conducting members, each having a discharge defining central aperture generally aligned with the tube axis, within and in contact with an electrically-insulating tube;

tensioning a mandrel provided through the central apertures to bring the central apertures into exact alignment; and

permanently securing the heat-conducting members to the electrically-insulating tube.

4,376,329

METHOD FOR PRODUCING AN IMPROVED ELECTRICAL LAYER CAPACITOR

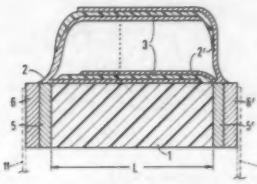
Reinhard Behn, Munich; Horst Pachonik, Unterhaching, and Gerhard Seebacher, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 78,942, Sep. 26, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,699

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843581

Int. Cl.³ H01G 7/00

U.S. Cl. 29—25.42 **5 Claims**



1. A method for the production of a capacitor, comprising the steps of:

providing an insulating synthetic resin plate, a thickness of which corresponds to a width of a carrier band to be employed in producing the capacitor;

on opposite side walls of the plate sealing on a contact layer of a high melting metal which is non-melting at a temperature of soldering during mounting of the capacitor;

applying onto the sealed-on metal layers a soldering metal layer;

separating the plate into the individual carrier bands which are to be later separated into the individual capacitors, the carrier band having top and bottom cut surfaces;

vapor depositing a valve metal layer on the top surface of the carrier band which extends over a side edge of and into contact with one of the contact layers but not the other;

applying a flat surface mask over portions of the valve metal layer which are not to be capacitively active in a region of said edge of the contact layer;

gas discharge polymerizing with an electrical gas discharge a dielectric layer onto the valve metal layer and mask, the dielectric layer tapering to substantially zero thickness at a corner formed between an edge of the mask and the valve metal layer being coated;

removing the mask and similarly vapor depositing successive metal layers alternating with successive gas discharge polymerization layers with appropriate masks onto the initial polymerization layer such that alternate metal layers connect to the same frontal contact layers; and

separating capacitor strips which arise in this manner into the individual capacitors.

4,376,330

FLEXURE-RESISTANT CALENDER ROLL

Hans Weidinger, Putzbrunn; Werner Ehm, Dachau, and Josef Pav, Krefeld, all of Fed. Rep. of Germany, assignors to Kleinwefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,691

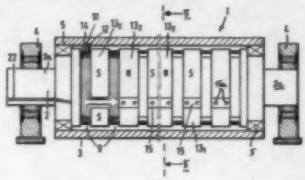
Int. Cl.³ B21B 13/02, 13/14

U.S. Cl. 29—116 AD **30 Claims**

1. The combination comprising:

(a) a pair of components including a stationary component and a rotary component, one of said components surrounding at least a portion of the other of said components;

(b) magnet means on a selected component of said pair and operative to generate electromagnetic forces when direct current is supplied thereto, said magnet means including a plurality of pole faces arranged next to one another in axial direction of said selected component, and each of said pole faces comprising a plurality of sections extending



in circumferential direction of said rotary component, each of said pole faces substantially entirely circumscribing said selected component and having a single polarity, and said pole faces being arranged such that neighboring pole faces have different polarities; and

(c) supply means for supplying direct current to said magnet means, said supply means being arranged so that one section of each of said pole faces is excitable independently of the remainder of the respective pole face.

4,376,331

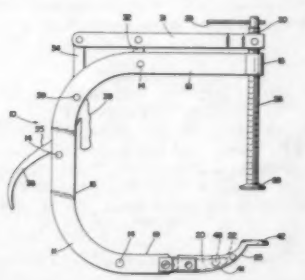
VALVE SPRING COMPRESSOR

James T. Clark, Fort Morgan, Colo., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 10, 1980, Ser. No. 205,352

Int. Cl.³ B23P 19/04

U.S. Cl. 29—219 **4 Claims**



1. A valve spring compressor, comprising a frame of generally c-shape having a pair of spaced legs at the lower portion thereof adapted for receipt of a pair of valve spring engaging jaws, said valve spring engaging jaws being releasably secured to said frame, said jaws being generally of u-channel configuration having confronting channel legs adapted for a linear sliding fit over said frame legs at the free end of said frame, said channel legs preventing transverse movement of said jaws relative to said frame, means connecting said channel legs in side-by-side relationship independently of said frame for movement of said jaws as a unit relative to said frame, means spacing said channel legs to a dimension corresponding to the spacing of said frame legs to allow a sliding fit thereover, and quick connect means on said frame for receiving the inner ends of said jaws and for releasably securing said jaws against sliding movement, said quick connect means comprising threaded fasteners on said frame adapted to be tightened to secure said

jaws and to be partly unthreaded to allow linear sliding movement and release of said jaws.

4,376,332

TOOL FOR REPAIRING AND REPLACING DAMAGED STUDS

Don J. Sandefur, 818 E. Water St., Tucson, Ariz. 85719

Filed Apr. 24, 1981, Ser. No. 257,382
Int. Cl.³ B23P 7/04
U.S. Cl. 29—402.08 **1 Claim**

1. A method for repairing the effects of a broken in-place stud or bolt by use of a dual diameter replacement stud comprising the steps of:

(a) selecting a dual diameter replacement stud having its smaller diameter identical to that of the broken stud or bolt;

(b) determining the counterdrill size and the tap for the larger diameter of said dual diameter stud was manufactured for making repairs where studs or bolts are broken in-place;

(c) counterdrilling the stud or bolt hole containing the broken segment of the original stud or bolt using the size drill preselected for said purpose as determined in step (b);

(d) retapping said counterdrilled hole using the size tap preselected for said purpose as determined in step (b); and

(e) driving the larger threaded diameter of said dual diameter replacement stud into said counterdrilled, retapped hole so as to effect the necessary repair.

4,376,333

METHOD OF JOINING MEMBERS OF METAL BY FORCED INSERTION

Hisanobu Kanamaru, Ibaraki; Moisei Okabe, Tokyo; Akira Tohkairin, Ibaraki, and Hideo Tatsumi, Sumiyoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1979, Ser. No. 48,734
Claims priority, application Japan, Jun. 21, 1978, 53-74258
Int. Cl.³ B23P 11/00, 15/14
U.S. Cl. 29—432 **5 Claims**

1. A method of joining members of metal by forced insertion, comprising the steps of:

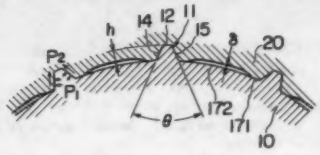
preparing a shaft with a cylindrical surface;

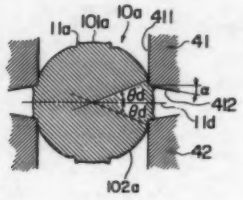
forming a plurality of axially extending paired projections projecting radially from the cylindrical surface, with the projections paired together being spaced from each other by an arcuate surface, the paired projections being formed by pressing on the cylindrical surface of the shaft with tools that each have an edge defined by a side face and a pressing face arranged at a tool angle of $(90+\alpha)°$ relative to the side face in a manner so that the edges of the tools start to contact with the periphery of the shaft and an angle θ_d in a range of 12° to 25° relative to a shaft radius line disposed between the tools and press substantially perpendicularly to said radius line;

preparing a member of a metal that is more ductile than that of the shaft;

forming a cylindrical surface within the member of a diameter slightly larger than the diameter of the surface of the shaft; and

forcedly inserting the shaft within the cylindrical surface of the member in a manner that metal flow takes place in the





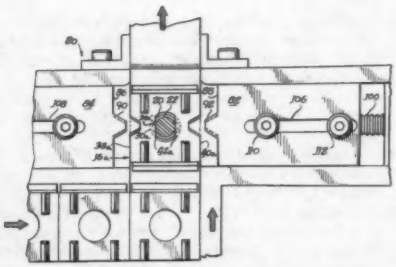
member so as to provide tight contact of the member with the projections of the shaft.

4,376,334

METHOD OF MAKING TERMINAL CLAMP ASSEMBLY

Richard G. Miller, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 27, 1981, Ser. No. 258,115
Int. Cl.³ B23P 11/00; B21K 1/44
U.S. Cl. 29—437 **9 Claims**



1. In a method of constructing a terminal clamp including the steps of providing a threaded fastener having a thread of predetermined crest diameter, a drive head and a shank portion intermediate said thread and said drive head and of lesser diameter than said thread crest diameter, providing a centrally apertured U-shaped clip, the central aperture thereof being of greater diameter than said thread crest diameter, inserting said fastener through said clip aperture until said clip aperture surrounds said shank portion, providing a centrally apertured clamping plate receivable within said U-shaped clip, the central aperture of said clamping plate being of greater diameter than said thread crest diameter, inserting said fastener through said clamping plate aperture until said clamping plate aperture surrounds said shank portion so as to position said clamping plate intermediate said U-shaped clip and said thread, the improvement comprising: the additional step of compressing a predetermined portion of substantially opposed outer edges of said clamping plate in a lateral plane substantially normal to said fastener shank until said clamping plate aperture deforms

in at least one dimension thereof to a lateral dimension smaller than said thread diameter, thereby captively assembling said clamping plate and said U-shaped clip with said fastener shank.

5. A method of constructing a threaded fastener with at least one captive member, comprising: providing a fastener blank including a drive head portion and a shank portion, forming said shank portion to define a thread of predetermined crest diameter and an unthreaded shank of diameter less than said thread crest diameter intermediate said thread and said drive head, heat-treating said formed fastener, and thereafter providing at least one member to be held captive on said fastener and having a through aperture of greater diameter than said thread crest diameter, inserting said fastener through said through aperture until said through aperture surrounds said unthreaded shank, and thereafter compressing predetermined portions of substantially opposed outer edges of said captive member until said through aperture deforms in at least one dimension thereof to a dimension smaller than said thread crest diameter, thereby captively assembling said captive member with said fastener.

4,376,335
METHOD OF MOUNTING A TIMING GEAR ON A CRANKSHAFT

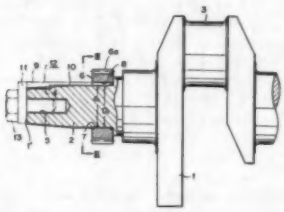
Hideo Furukawa, Oyama; Masaaki Okamoto, Utsunomiya, and Kazuyoshi Shinbori, Tochigi, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,816

Claims priority, application Japan, Oct. 20, 1980, 55-148437[U]

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—447 **2 Claims**



1. A method of mounting a timing gear on a crankshaft having a mounting portion integrally formed therewith, the timing gear having formed therein a bore having a diameter which is made smaller than that of the mounting portion of the crankshaft and a first key way formed in the bore of the timing gear, the first key way being angularly indexed with respect to a tooth of the timing gear, the mounting portion of the crankshaft having formed therein a second key way angularly indexed with respect to a pin portion of the crankshaft, the method comprising:

securing a guide jig having a mounting key portion and a guide key portion formed therein to the mounting portion of said crankshaft with the mounting key portion being in register with said second key way;

heating said timing gear to expand the diameter of the bore so that the same becomes larger than that of the mounting portion of said crankshaft;

mounting said timing gear on the mounting portion of said crankshaft by engaging the first key way of said timing gear with the guide key portion of said guide jig;

detaching said guide jig from the mounting portion of said crankshaft while keeping said timing gear mounted in place; and

cooling said timing gear to shrink the diameter of the bore so that the same tends to become smaller than that of the mounting portion of said crankshaft thereby firmly mounting said timing gear on the mounting portion of said crankshaft.

4,376,336
METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE

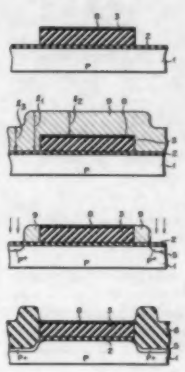
Norio Endo, and Hisakazu Iizuka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 6, 1981, Ser. No. 290,429

Claims priority, application Japan, Aug. 12, 1980, 55-110906

Int. Cl.³ H01L *21/26*

U.S. Cl. 29—571 **9 Claims**



1. A method for fabricating a semiconductor device comprising the steps of:

forming an insulating layer on a semiconductor substrate;

selectively forming an oxidation preventive film on said insulating layer;

depositing polycrystalline silicon on the entire surface of said substrate including said oxidation preventive film;

selectively etching said polycrystalline silicon so as to leave said polycrystalline silicon only around the sides of said oxidation preventive film by an etching method having a directivity perpendicular to the surface of said substrate;

ion-implanting an impurity for preventing inversion in said substrate using as a mask said oxidation preventive film and said polycrystalline silicon remaining therearound; and

forming a field insulator film including an oxide of said polycrystalline silicon by oxidizing the surface of said substrate.

4,376,337
METHOD OF MANUFACTURING MAGNETIC TRANSDUCER HEAD

Tomio Kobayasi, Shiogama, and Kouji Fukushi, Tagajo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 102,645, Dec. 12, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 304,672

Claims priority, application Japan, Dec. 19, 1978, 53-157138

Int. Cl.³ G11B *5/42*

U.S. Cl. 29—603 **3 Claims**

1. A method of manufacturing a magnetic transducer head comprising the steps of;

(a) preparing first and second magnetic cores, each having a first planar surface and a second planar surface opposite to said first surface;

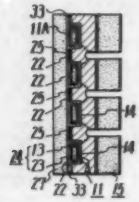
(b) forming first parallel grooves in one direction, leaving a predetermined width on said each first surface of said first and second cores;

(c) forming a second groove extending perpendicular to said one direction on said first surface of at least one of said first and second cores;

(d) forming a conductive line on said first surface and in said first parallel grooves of said first core extending along a direction substantially perpendicular to said one direction;

(e) bonding said first and second cores to form an operating magnetic gap between said first surfaces of said first and second cores and place said conductive line to meet said second groove, and filling said first and second grooves with non-magnetic material;

(f) removing a part of said first core from said second surface



so as to dispose portions of said conductive line and to separate said conductive line in said first parallel grooves; and

(g) forming second conductive material on said second surface of said first core to connect said portions of said first conductive line disposed on said second surface so as to form a coil around said first core.

4,376,338

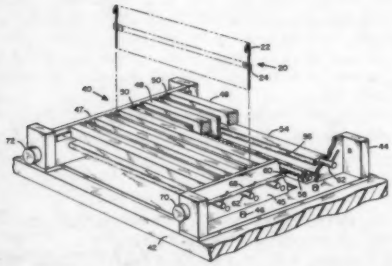
APPARATUS FOR ALIGNING AND PRESS-FITTING CONNECTOR TERMINALS INTO A SUBSTRATE

Thomas J. Wickham, Lakeville, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Division of Ser. No. 115,839, Jan. 28, 1980, Pat. No. 4,316,321. This application Aug. 10, 1981, Ser. No. 291,522

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—741 **8 Claims**



1. A tool for aligning the shanks of individual ones of a plurality of connector terminals with individual ones of a like plurality of apertures in a substrate to make the terminals ready for press-fitting to said substrate, said connector terminals being supported in predetermined spaced relation by a support strip, said apertures being aligned in a row in essentially the same predetermined spaced relation, said tool comprising:

a housing adapted to be positioned on said substrate, said housing having a slot for positioning over said row of apertures and for receiving said terminals supported by said support strip;

positioning means supported by said housing adjacent one side of said slot, said positioning means being operable between a rest position and an actuated position, said positioning means having a plurality of notches each engaging individual ones of said shanks of said terminals in said slot when said positioning means is in its actuated position;

load means supported by said housing adjacent the opposite side of said slot, said load means being operable between a rest position and an actuated position, said load means having a surface for engaging said shanks of said terminals in said slot when said load means is in its actuated position, whereby when said load means is in its actuated position said surface of said load means engages said shanks of said terminals to bias said shanks toward said positioning means, said load means and said notches in said positioning means being disposed in relation to said apertures as to align said shanks of said terminals with individual apertures in said substrate when said load means and said positioning means are in their respective actuated positions; and

actuator means for moving said load means and said positioning means between their respective rest and actuated positions.

4,376,339

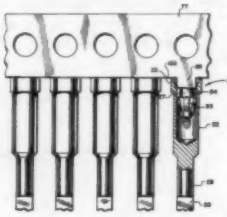
METHOD AND APPARATUS FOR ORIENTING INTEGRATED CIRCUIT CLIPS AND SOCKETS AND ASSEMBLING THEM INTO CONNECTOR CONTACTS

J. Preston Ammon; Harry R. Weaver, and Evan Evans, all of Dallas, Tex., assignors to ELFAB Corporation, Addison, Tex.

Filed Sep. 15, 1980, Ser. No. 187,499

Int. Cl.³ H01R *43/00;* **B23P** *19/00*

U.S. Cl. 29—876 **32 Claims**



1. A method of mounting oriented socket contacts for an electrical connector wherein each of said contacts comprises a socket portion including a lead clip having inwardly and downwardly extending tines in oriented relationship with a lower tail portion of the contact, said method comprising the steps of:

providing an orientation plate having adjacent apertures formed in the upper surface, said adjacent apertures being spaced from one another a preselected distance for arranging said lead clips in a preselected array;

providing a quantity of loose randomly oriented lead clips, each of said clips comprising a generally cylindrical ring open at the top and downwardly extending resilient tines;

placing said clips on the upper surface of said orientation plate for arrangement upon said plate;

vibrating said plate to cause the loose clips to be positioned within said apertures and arranged upon said plate;

providing a carrier strip having a plurality of depending projections adapted for engaging and retaining said lead clips thereto;

orienting said lead clips within said apertures and relative to said carrier strip projections;

moving said carrier strip relative to said lead clips and securing said lead clips upon said carrier strip in oriented alignment therewith;

advancing said lead clip supporting carrier strip from alignment with the orientation plate;

positioning socket contacts in preselected arrangement and rotational orientation in alignment with said carrier strip; and

moving said carrier strip relative to said contacts to secure

said lead clips within the socket portion of said contacts in select orientation therebetween.

24. An apparatus for orienting component lead engaging clips having inwardly and downwardly extending resilient tines with respect to the longitudinal axis of a carrier strip said apparatus comprising;

an orientation plate having adjacent apertures formed in the upper surface, said adjacent apertures being spaced from one another a preselected distance for arranging said lead clips in a preselected array;

means for placing a quantity of loose randomly oriented lead clips, each of said clips comprising a generally cylindrical ring open at the top having downwardly extending resilient tines, on the upper surface of said orientation plate for arrangement upon said plate;

means for vibrating said plate to cause the loose clips to be positioned within said apertures and arranged upon said plate;

a carrier strip having a plurality of depending projections adapted for engaging and retaining said lead clips thereto;

means for orienting said lead clips within said apertures and relative to said carrier strip projections; and

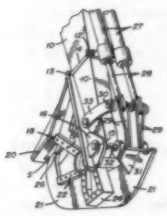
means for moving said carrier strip relative to said lead clips to secure said lead clips upon said carrier strip in oriented alignment therewith.

4,376,340

MATERIAL HANDLING AND SHEARING ATTACHMENT FOR A BACKHOE

Michael Ramun, and John R. Ramun, both of 2100 Poland Ave., Youngstown, Ohio 44502

Filed May 7, 1981, Ser. No. 261,679
Int. Cl.³ E02F 3/28
U.S. Cl. 30—134 **7 Claims**



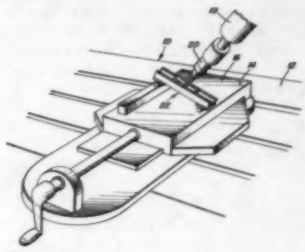
1. An improvement in a cutting and manipulating attachment for a backhoe, the bucket of which has been removed, and having a boom with a controlled piston and cylinder connected thereto, the improvement comprising: means for keeping a cutting portion of a movable cutting blade in shearing relation to a fixed cutting blade throughout the entire extent of the shearing movement of the blades with respect to each other; said movable blade having an elongated substantially hook-shaped end portion hooked generally toward said fixed blade; said cutting and manipulating attachment comprising: a mounting body and means for attaching the same to the boom of the backhoe; means positioning said fixed cutting blade on said mounting body and means located at a first end of said fixed cutting blade pivotally mounting said movable cutting blade on said mounting body in pivotal relation to said fixed cutting blade; said means for keeping the cutting position of said movable cutting blade in shearing relation to said fixed cutting blade comprising a pair of spaced parallel guides located adjacent and fixed to a second end of said fixed cutting blade and extending from said fixed cutting blade second end at an obtuse angle with respect to said fixed cutting blade and defining an elongated guide path, said guide path being positioned and sized to receive said hook-shaped end portion of said movable hook-shaped cutting blade before said cutting portion of said movable blade comes into shearing action with respect to a workpiece disposed between said blades, so that said hook-shaped end portion and said pair of guides hold the workpiece for cutting as said movable cutting blade cutting portion moves in shearing relation with said fixed blade; and links operatively connecting said movable cutting blade to said piston and cylinder assembly so that the same can be moved relative to said fixed blade thereby.

4,376,341

TOOL-TO-WORKPIECE ANGLE GAUGE

Sebastian P. Lombardo, 5140 SW. 40th Ave., Ft. Lauderdale, Fla. 33314

Filed Sep. 2, 1981, Ser. No. 298,806
Int. Cl.³ G01B 3/56; B27G 23/00
U.S. Cl. 33—174 S **7 Claims**



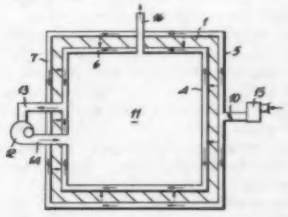
1. A tool-to-work piece angle gauge comprising a base block having a pair of laterally spaced downwardly facing constant radius arcuate bearing surfaces generated about parallel axes lying in a reference plane, a shank assembly mounted from said base block for oscillation about a third axis paralleling said axes and including an exposed chank disposed and swingable in a plane normal to said third axis, said block and shank assembly including coacting indicating means operative to indicate when said assembly is rotated to a position about said third axis with said exposed shank disposed normal to said reference plane.

4,376,342

THERMALLY INSULATING WALL STRUCTURE PARTICULARLY FOR KILNS

Gabriele Gavioli, Via Panigale, 6, Bologna, Italy

Filed Sep. 30, 1980, Ser. No. 192,263
Claims priority, application Italy, Oct. 8, 1979, 4949/79[U]
Int. Cl.³ F26B 9/06
U.S. Cl. 34—86 **1 Claim**



1. A wall structure for thermally insulating an enclosed space to be heated such as a ceramic kiln, said enclosed space being defined by four side panels and top and bottom panels, said wall structure comprising a a layer of an air-permeable thermally insulating material located adjacent to and coextensive with, but spaced from the exterior surface of at least one of said panels, to define an internal chamber, and an external

chamber formed by a panel located adjacent to and coextensive with said insulating material on the opposite side of said insulating material from said internal chamber, means to enclose said internal and external chambers such that air flow therethrough is restricted to passage through said insulating material, said external chamber having at least one air intake mouth and said internal chamber having at least one air exhaust mouth leading to said enclosed space, air supplying means effective to create an air flow from said intake mouth to said exhaust mouth, whereby said air passes from said external chamber, through said air-permeable thermally insulating material wherein said air is heated and thereafter passes into said internal chamber and into said enclosed space.

4,376,343

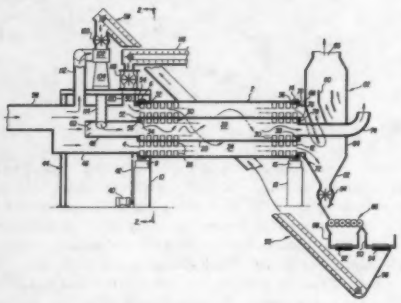
METHOD AND APPARATUS FOR DRYING BAGASSE

Henry J. White, P.O. Box 215, and Bradford W. Eaves, P.O. Box 220, both of Pa'auhau, Hi. 96775

Filed Jul. 21, 1981, Ser. No. 285,574

Int. Cl.³ F26B *11/02*; F23G *5/02*

U.S. Cl. 34—109 **10 Claims**



1. A drying method for producing primary and secondary dried bagasse from raw bagasse, comprising the steps of:

passing the raw bagasse through an annular chamber connected directly with a source of flowing hot exhaust gases, the flowing hot gases being effective to move the raw bagasse through the annular chamber and to remove moisture therefrom to produce primary dried bagasse, and the walls defining the annular chamber being rotated about a horizontal axis to agitate the raw bagasse during its passage through the chamber;

collecting the primary dried bagasse at the outlet end of the annular chamber;

dividing a portion of the primary dried bagasse from the remainder thereof, as it is collected;

conveying the divided portion of primary dried bagasse into a cylindrical inner chamber disposed concentrically within said annular chamber and connected with the same source of flowing hot exhaust gases as said annular chamber, said divided portion being moved through said inner chamber and being dried by said flowing hot gases to produce secondary dried bagasse, and the wall defining said inner chamber also being rotated about said horizontal axis; and

collecting the secondary dried bagasse from the outlet end of said cylindrical chamber.

4,376,344

INSULATED BOOT BLANKET

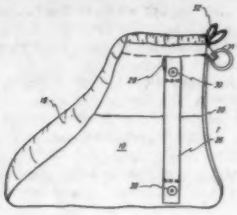
Cheston B. Kimsey, P.O. Box 197, Clarkesville, Ga. 30523

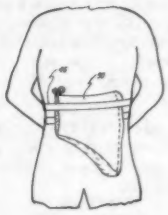
Filed Jun. 10, 1981, Ser. No. 272,352

Int. Cl.³ A43B *3/16*

U.S. Cl. 36—7.1 R **16 Claims**

4. A boot blanket comprising a pair of side panels with top, bottom, front and rear edges, and a longitudinal panel having a central portion secured to the bottom edges of said side panels to form a bottom panel, having a front portion secured to the front edges of said side panels to form a front panel, and having a rear portion secured to the rear edges of said side





panels to form a rear panel, the top edges of said side panels and the free ends of said front and rear panels forming an opening for the leg of the wearer, said back panel having a zipper extending over the length thereof and opening downwardly from said leg opening to said bottom panel.

4,376,345

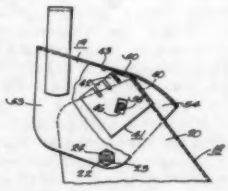
FLEXIBLE SEAL FOR A PIVOT JOINT IN A SNOW THROWER CHUTE

Lynn E. Hochwitz, Sheboygan Falls, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 14, 1981, Ser. No. 330,658

Int. Cl.³ E01H *5/00*

U.S. Cl. 37—260 **5 Claims**



1. In a snow thrower, the combination comprising:

a generally upright discharge chute presenting at its upper end a pair of generally upright side walls and an upwardly and forwardly inclined top wall interconnecting said side walls,

a deflector having a top wall with a rear portion in overlying relation to the top wall of said chute and a pair of generally vertical side walls depending from opposite lateral sides of said top wall having portions in adjacent, overlapping relation to said side walls of said chute,

a pair of pivot means pivotally interconnecting adjacent side walls of said deflector and chute for pivotal movement of

said deflector relative to said chute about a generally horizontal axis, and

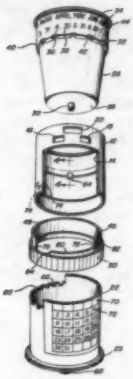
a flexible seal of substantially uniform thickness interposed between said chute and deflector, said seal having rear top and side portions secured to the upper and laterally outer surfaces, respectively, of said top and side walls of said chute and having a front portion with a plurality of spaced, forwardly extending fingers in sealing engagement with the inside surface of said deflector.

4,376,346

PERPETUAL CALENDAR

Milton T. Nelson, 4818 Lena Ct., North Fort Myers, Fla. 33903

Filed Oct. 22, 1981, Ser. No. 313,980
Int. Cl.³ G09D *3/06, 3/10*; G09F *3/00*
U.S. Cl. 40—114 **14 Claims**



1. A perpetual calendar including first and second superposed panel member portions mounted for relative back and forth movement along a predetermined path, one of said panel member portions having a generally rectangular window formed therein, the other of said panel member portions including number indicia arranged thereon in seriatim repetitively in coordinates of seven extending along said path and including rows of indicia spaced transversely of said path, said window being of a dimension transverse to said path to view six laterally spaced rows of spaces therethrough and of a dimension longitudinally of said path to view seven indicia spaces in each row, and a single view masking panel member portion disposed intermediate said first and second panel member portions and including a pair of elongated side-by-side indicia space masking strip portions extending along said path and including one pair of corresponding ends facing in one direction along said path and staggered lengthwise of the latter a distance equivalent to at least seven of said indicia spaces, said view masking strip portions being manually shiftable along said path to selectively mask the two rows of spaces adjacent one longitudinal side of said window.

4,376,347

LIGHT POWERED MOBILE

Marion E. Thompson, 2807 N. Prospect, Colorado Springs, Colo. 80907

Filed Sep. 18, 1981, Ser. No. 303,500
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—441 **29 Claims**

1. An assembly comprising: a base; a d.c. motor mounted with said base and having a shaft extending outwardly therefrom, the shaft having a distal curved end having a given radius of curvature, and the shaft having a first predetermined cross-sectional area adjacent said distal end; a solar cell; means electrically interconnecting said solar cell and said d.c. motor; and a display member including a mounting means, said mounting means including: a body member, means defining a bore in said body member having a second cross-sectional area greater

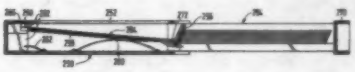
than said first cross-sectional area and dimensioned to loosely receive said motor shaft therein, and a termination of said bore comprising a curved abutment surface having generally about the same radius of curvature as said motor shaft.

4,376,348

PICTURE VIEWER

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Apr. 8, 1980, Ser. No. 138,641
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1979, 2914351
The portion of the term of this patent subsequent to Jun. 20, 1998, has been disclaimed.
Int. Cl.³ G09F *11/30*
U.S. Cl. 40—513 **192 Claims**



1. Picture viewing device having a housing for accommodating a pile of pictures, of which the uppermost picture lies beneath a housing window, having a slider member that may be pulled out of the housing and re-inserted parallel to the viewing window, and having a picture change mechanism consisting of a transporter, by means of which a picture can be removed from one side of the pile as the slider member is withdrawn and is guided to the other side of the pile again as the slider member is pushed in, and of a retaining device preventing the remainder of the pile from being transported, and having an externally operable device for disabling the picture change mechanism for the removal of the entire pile out of the housing by means of the slider member, the retaining device being provided in the form of a separator on the slider member and the transporter being provided in the form of retentive elements on a pressure arrangement located in the housing under spring bias, wherein the pressure arrangement comprises a plate supported by springs, the plate being of dimensions substantially corresponding to the size of the pictures, and on which the retentive elements are arranged.

4,376,349

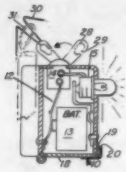
NIGHT TIME FISHING AID

Donald J. Yarczower, 84 Weed Ave., Staten Island, N.Y. 10306

Filed Nov. 17, 1980, Ser. No. 207,766
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—17 **1 Claim**

1. The combination of a fishing pole and a night time fishing aid, the fishing pole comprising an elongated rod having upper and lower ends, a loop guide extending from the upper end, a

fishing reel coupled to the lower end, a fishing line spanning the rod from the fishing reel and extending from the upper end of the rod; the fishing aid comprising a case, clip means on the case for mounting it onto the elongated rod adjacent said upper end, a battery in said case, a lamp in said case and visably extending therefrom, a toggle switch in said case, an electric circuit interconnecting said lamp, battery and toggle switch such that when said toggle switch is turned on said lamp remains lit, said toggle switch having a toggle lever extending upwardly from said case with its on position angularly directed



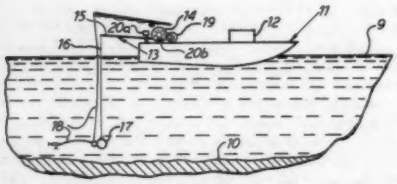
towards said rod and its off position being angularly directed away from said rod, an elongated opening formed in said toggle lever, a slot in said toggle lever to facilitate entry into said elongated opening, said fishing line passing upwardly along said elongated rod, then downwardly through said loop guide, through said elongated opening in said toggle lever, back upwardly through said loop guide and then extending from said elongated pole, whereby pulling on the extended fishing line causes said toggle lever to move from its off position to its on position to thereby turn on the lamp.

4,376,350

AUTOMATIC DOWN RIGGER CONTROL SYSTEM

John J. Bednarz, Elmhurst; Phillip J. Moser, Bensenville, and Roger L. Rosenberg, Arlington Heights, all of Ill., assignors to Circom, Inc., Bensenville, Ill.

Filed Jan. 21, 1981, Ser. No. 226,930
Int. Cl.³ A01K *89/017*
U.S. Cl. 43—26.1 **15 Claims**



1. An automatic down rigger control system for use with a down rigger trolling line operated by a motor means for raising and lowering the trolling line, comprising:

control system means for automatically controlling the motor means for lowering an end of the trolling line to a predetermined depth point and automatically raising the end of the trolling line to a predetermined surface point in a region of the surface of the water, said control system means including memory means for storing said predetermined depth point and predetermined surface point;

said memory means comprising an electronic memory which receives as an input said predetermined surface point in response to actuation of a zero switch means and receives as an input said predetermined depth point in response to actuation of a store switch means; and

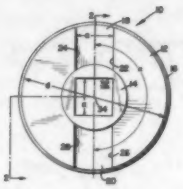
motor direction trolling control means for comparing depth as established by a counter with said stored predetermined depth point or predetermined surface point.

4,376,351

WHEEL

Peter Larws, Schlappmühler Pfad 13, 6390 Usingen, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 294,047
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032969
Int. Cl.³ A63H *33/04, 17/26*
U.S. Cl. 46—23 **6 Claims**



1. A wheel for use in a construction system of building bricks in the form of the letter "H" which system is based on an arbitrary standard dimension "a"; said wheel comprising:

A. A rim having two opposing sides and a diameter of $12a/\pi$, said rim having a plurality of axially extending and radially aligned grooves on each side of the rim, equally spaced around the circumference of the rim; each of said grooves having opposing sides spaced from each other by the distance "a"; said rim having an axial cylindrical opening; and

B. a hub rotatably mounted in the axial cylindrical opening of the rim; said hub having an axially disposed square opening having dimensions "a" by "a";

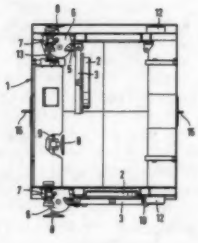
wherein the wheel has a width 2a.

4,376,352

PERSONNEL AIR LOCK

Pentti Soininen, Vantaa, and Olle Henrichson, Helsinki, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Jan. 31, 1980, Ser. No. 117,244
Claims priority, application Finland, Feb. 2, 1979, 790346
Int. Cl.³ E06B *7/00*
U.S. Cl. 49—68 **6 Claims**



1. A closable passage arrangement interconnecting two spaces, said arrangement comprising a closure unit having two passage openings each provided with a door or the like lockable with a locking bolt mechanism, each door connecting said closure unit to a different one of said spaces and being provided with driving means for operating said door, said driving means comprising, for each door, a power transmission unit arranged to influence separately a mechanism for turning the door and a mechanism for operating said locking bolt mechanism of the door, said power transmission units of the doors being interconnected by means of a common shaft, said power transmission units including a pin-and-fork mechanism, wherein a rotatable power transmission member provided with

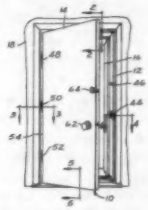
crank pins or the like is cooperating with a number of fork members, said driving means comprising a plurality of door operating stations each including a door operating member being directly or by means of said common shaft connected to said power transmission units, said driving means including mechanical means positively guiding the functions of said driving means during opening and closing of any of said doors and means mechanically guiding said functions to take part only in one given order, said functions being obtainable from any of said door operating stations, and means connecting the operating mechanisms of the doors for mechanically locking one door during operation of the other door.

4,376,353

BUILDING STRUCTURE

Charles Helfman, 19533 W. 7 Mile Rd., Detroit, Mich. 48219

Filed Nov. 5, 1980, Ser. No. 204,219
Int. Cl.³ E06B *1/04*
U.S. Cl. 49—504 **4 Claims**



1. Building structure comprising an opening in a building, door jambs at the opposite sides of the opening and a head member at the top of the opening in the building structure, a metal frame positioned in the opening in engagement with the door jambs and head member including angle iron vertically extending jamb members and an angle iron horizontally extending head member and a metal door sill extending between the angle iron frame jamb members at the bottom thereof, said metal frame being positioned on the inside of the opening with one short leg of the angle iron members thereof being approximately ¼ inch long and extending substantially in the plane of the opening on the inside thereof and terminating at interior trim around the opening in the building and the other, longer leg of the angle iron members extending transversely into the opening toward the outside thereof, means securing the metal frame to the building structure about the opening, and a wood door secured to the metal frame for installation with the metal frame.

4,376,354

DOOR FRAME ASSEMBLY

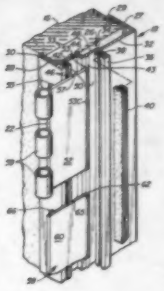
Richard H. Passovoy, San Ramon, Calif., assignor to Anodex, San Ramon, Calif.

Filed Feb. 25, 1981, Ser. No. 237,826
Int. Cl.³ E06B *1/04*
U.S. Cl. 49—504 **16 Claims**

1. Apparatus for constructing a door frame in an opening formed in a wall to accommodate a door, such apparatus comprising:

a frame member including a central web adapted to span the width of the wall and a pair of side flanges extending from the lateral edges of the web and adapted to fit over the edges of the wall circumscribing the opening, said web formed of first and second longitudinally-extending portions and including first and second longitudinally-extending slots, the first slot located proximately central relative to the web, and the second slot aligned normal to the first proximate the lateral edge of the web's second portion;

at least two hinge members each having a hinge plate which includes a first and a second elongate tongue adapted to engage and mate with the respective slots in the frame member so that the hinge members can be attached to the frame member where desired after installation of the frame member in the opening, the second tongue aligned substantially normal to the first tongue to minimize detachment of the hinge plate from the frame member under stress; and



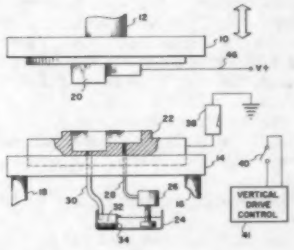
a plurality of cover plate sections, each including a first and second elongate tongue adapted to engage and mate with the respective slots in the frame member, the cover plate sections adapted to be cut to fit the gaps between the hinge plates and the ends of the frame member to provide a finished aesthetically pleasing door frame.

4,376,355

ABRADING APPARATUS HAVING ZERO REFERENCE SENSING MEANS

Marten C. Hausermann, Addison, Ill., assignor to Hausermann Abrading Process Company, Du Page County, Ill.

Filed Apr. 22, 1981, Ser. No. 256,382
Int. Cl.³ B24B *19/00*
U.S. Cl. 51—58 **4 Claims**



1. An improved apparatus for forming electrical discharge machining electrodes said apparatus being of the type including a first platen, a second platen mounted in superimposed relation and adapted to be driven vertically with respect to said first platen, a die member having an abrasive surface mounted on one of said platens, a workpiece member mounted on the platen opposite the platen on which said die member is mounted in working alignment with said die member, means for applying horizontal oscillatory rotary motion to said first platen, vertical drive means for infeeding said workpiece member and said die member into contact with each other while said oscillatory rotary motion is being applied to thereby abrasively shape said workpiece member to the form of said die member, and wherein said improvement comprises

an electrically conductive coating disposed over at least a lower portion of said abrading die;

a source of electric potential coupled to one of said electrode workpiece and said electrically conductive coating; and

switching means coupled to the other of said electrode workpiece and said electrically conductive coating,

whereby when said coated abrading die is first driven into contact with said electrode workpiece said electric potential is coupled to and operates said switching means to thereby indicate said contact.

4,376,356

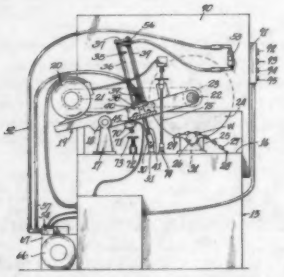
CUT-OFF SAWS

Charles T. Everett, 308 Country Club Dr., Warren, Ohio 44483

Filed Feb. 15, 1980, Ser. No. 121,784

Int. Cl.³ B24B *51/00*

U.S. Cl. 51—98 R **1 Claim**



1. Apparatus for severing work, comprising a housing having a supporting surface, a rocker arm pivotally mounted intermediate to its ends on said supporting surface for rocking movement in a vertical direction, a motor supported on one arm of said rocker arm and a disc-like cutter rotatably mounted on the other arm of said rocker arm and having connection with said motor so as to be rapidly rotated thereby, a vise for clamping the work in position whereby said cutter engages and cuts through the work in its downward movement and is returnable to an upward position to permit said work to be shifted, the improvement comprising:

a fluid cylinder for effecting rocking action of said rocker arm and consequent up-and-down movement of said cutter,

a solenoid valve for controlling flow of fluid under pressure to said cylinder,

a limit switch mounted on the upper portion of an upright rod and adjustable to various positions axially therealong, said limit switch having an operating member, the lower end of said rod being pivotally connected to said housing supporting surface,

said upper portion of said upright rod extending freely through the central opening of a disc-like ring which is connected to and movable with said rocker arm other arm, said disc-like ring engaging said limit switch operating member at a selectable upper position of said rocker arm other arm,

said limit switch and the solenoid of said valve being included in an electrical circuit whereby said valve controls flow of fluid to said cylinder in a manner to interrupt upward movement of said cutter when said limit switch operating member is engaged by said disc-like ring.

4,376,357

MACHINE TOOLS

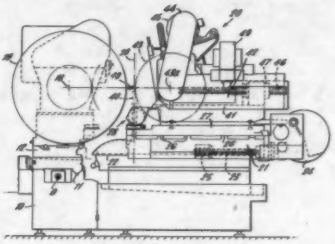
Raymond T. Shackleton, Keighley, England, assignor to Keighley Grinders (Machine Tools) Ltd., West Yorkshire, England

Filed Aug. 20, 1980, Ser. No. 179,756

Claims priority, application United Kingdom, May 21, 1980, 8016766

Int. Cl.³ B24B *19/14*

U.S. Cl. 51—105 SP **15 Claims**



1. A machine tool comprising, means to support and rotate a workpiece about a fixed axis for an operation to be carried out on a peripheral portion of the workpiece, a rotary tool having a peripheral cutting face, a tool carrier on which the tool is mounted, means to feed the tool carrier toward and away from the fixed axis for the tool to act on the workpiece, the means comprising a slideway extending transversely to the fixed axis and a slide on which the tool carrier is mounted and drive means for moving the slide in either direction along the slideway, a pivotal mounting for the rotary tool on the tool carrier, the pivotal mounting being adjustable about a further axis lying tangentially to a circle centered on the fixed axis, the slide having, at the end thereof adjacent the fixed axis, a rotary mounting defining the further axis, the slide having a bearing face, the tool carrier being mounted on the bearing face for sliding movement about the rotary mounting, a lead screw rotatably mounted on the slide and carrying a nut to which the carrier is connected so as to turn the tool carrier with respect to the slide about the further axis to adjust the angle of cut of the rotary tool, means for defining the rotational positions of rotational adjustment of the carrier with respect to the slide about said further axis, said defining means comprising a control member extending parallel to the lead screw and having a plurality of stops spaced apart along the member and an adjustable cam mounted to move with the carrier and engageable with one or other of the stops according to the adjustment of the cam to determine the position to which the tool carrier may be moved, the tool being located on the pivotal mounting so that the further axis extends tangentially to the peripheral cutting face of the tool whereby adjustment of the tool about the further axis does not otherwise displace the circumferential cutting face of the tool at the point where it engages the workpiece.

4,376,358

SURFACE TREATING APPARATUS

John J. Shelton, Tuttle, Okla., assignor to Robert T. Nelson, Oklahoma City, Okla.

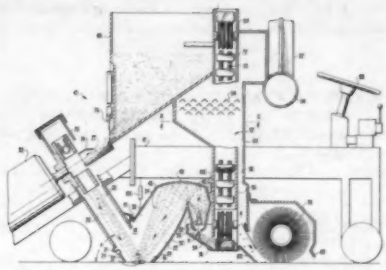
Filed Dec. 20, 1976, Ser. No. 752,787

Int. Cl.³ B24C *3/06*

U.S. Cl. 51—429 **34 Claims**

1. An apparatus for the treatment of a surface with particulate abrasive which is projected at high velocity against said surface, comprising an enclosure having an opening therein adapted to confront said surface, wherein said enclosure comprises a delivery section having a projecting means therein for propelling abrasive through the opening to contact the surface; a first collection bin in communication with said projecting

means for supplying abrasive thereto; a second collection bin in communication with said enclosure to receive abrasive rebounded from said surface; said second collection bin being below said first collection bin and adapted to receive abrasive directed thereto by the kinetic energy of said abrasive rebounded from said surface; a chute being positioned to convey abrasive rebounded from said surface, said chute having a generally inverted U-shaped having an upwardly directed concentration zone and a downwardly directed attenuation zone having a discharge opening, said upwardly directed con-



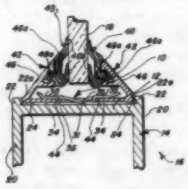
centration zone having walls adapted to direct rebounded abrasive to the attenuation zone wherein rebounded abrasive strikes the walls of the attenuation zone, thereby decreasing the kinetic energy of the abrasive prior to its passing to the discharge opening; said second collection bin being in communication with the discharge opening of said attenuation zone to receive abrasive passing from the discharge opening; and recirculating means in communication with said second collection bin to lift abrasive from said second collection bin to said first collection bin.

4,376,359

FASTENER CLIP FOR GLAZED DOORS

Ronald E. Redman, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Dec. 1, 1980, Ser. No. 211,512
Int. Cl.³ E06B 3/62
U.S. Cl. 52—127 **23 Claims**



1. A fastener clip for securing one or more glazing strips in position along a web of a frame member extending along a peripheral edge of a glazing panel flanked by said strips, said web including a substantially planar base surface generally normal to a face of said glazing panel and a pair of upstanding ribs engaged by said glazing strips when positioned to glaze said panel and extending along opposite edges of said base surface, said base surface and said ribs forming a pair of opposed recesses extending longitudinally of said frame member along opposite sides, each of said recesses adapted to receive and hold a corner portion of a glazing strip engaged therewith; said fastener clip comprising:

a unitary body of thin sheet material including a pair of integral wedging arms on opposite sides of a central portion of said body, said arms having free outer end portions adapted to extend into said opposed recesses of said frame member for securing said fastener clip in place on said web between said ribs without other fasteners;

slot means defined in said central portion of said body between said pair of arms adapted for receiving a tool removably engageable to rotate said body about an axis normal to said web from a first position when said free outer end portions of said arms are clear of said ribs toward a second secured position wherein said end portions are forcefully engaged against opposite facing inside faces of said ribs and said base surface, and are deflected inwardly toward said central body portion by said forceful engagement for tightly securing said fastener clip in place on said web; and

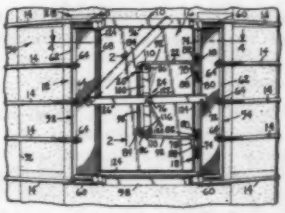
integral holding means struck from said body including a pair of fingers between said wedging arms for engaging an inner edge portion of a glazing strip to retain said strip in position engaging a rib along said frame member.

4,376,360

ACCESS DOOR ASSEMBLY FOR A SILO

Newell B. Hanson, Lake Lillian, Minn., assignor to Hanson Silo Company, Lake Lillian, Minn.

Filed Jan. 26, 1981, Ser. No. 228,134
Int. Cl.³ E04H 7/00
U.S. Cl. 52—193 **8 Claims**



1. An access door assembly for use a closure for an access opening in a silo, said silo having a cylindrical wall retained in place by a plurality of surrounding hoops to prevent outward expansion, said assembly comprising:

a door;

frame means, attached to said silo with said hoops, for supporting said door, said frame means including a pair of laterally spaced, vertical members and vertically spaced step members attached thereto and extending therebetween whereby said frame means also supports said step members, said step members being spaced outwardly from said silo wall and said hoops across said access opening to provide a useable ladder for said silo, one of said step members being rotatably attached to said frame means thereby allowing more complete use of said access opening;

hinge means for swingably attaching said door to said frame means; and,

means for latching said door closed, said latching means including a member attached to said door and means for releasably coupling said member to said one step member;

whereby when said door is closed, said door closes said access opening and said step members form a ladder supported by said frame means along said silo.

4,376,361

PARTITION WALL CONSTRUCTION

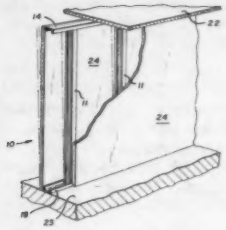
Ralph E. Michael, Elk Grove, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 7, 1980, Ser. No. 137,666
Int. Cl.³ E04B 2/56
U.S. Cl. 52—241 **15 Claims**

1. In a partition wall construction having two spaced apart

rows of wall board connected to flanged studs wherein said studs are supportably engaged within opposingly spaced apart channels, a bottom channel opening upwardly with bottom portions of the studs residing therein and an upper channel opening downwardly with top portions of the studs residing therein, the improvement comprising:

a device for prevention of squeaking at stud and runner engagements when said partition wall is subjected to racking forces, said device comprising a plurality of clips each having in cross-section a hairpin-like configuration wherein an elongate plate portion terminates in a thickened base portion, said base portion having an angled plate portion including a first leg portion angling back toward the elongate plate and thence terminating in an outwardly angling second leg portion, said configuration forming a hairpin-like shape defining a slot between the elongate plate and angled plate portion;



stud flanges nested in said slots and contacting the thickened base portion, wherein said elongate plate is disposed between flanges of the channels and flanges of the studs;

said clips comprising acrylonitrile-butadiene-styrene; and

wherein said device prevents squeaking and clicking upon subjection of said partition wall construction to horizontal racking forces tending to force the partition wall construction into a generally parallelogram-shape.

4,376,362

TRUSS EMPLOYING BOTH METALLIC AND NON-METALLIC WEBS

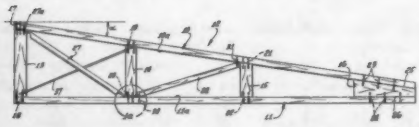
Thomas E. Jackson, Woodland, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Continuation of Ser. No. 13,328, Feb. 21, 1979, Pat. No. 4,245,449. This application Jan. 14, 1981, Ser. No. 225,147

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—639 **1 Claim**



1. In a truss, the combination comprising

(a) upper and lower chord members extending in generally the same longitudinal direction and in spaced apart relation,

(b) means connected to said upper and lower chord members and including multiple upright blocks which are longitudinally spaced apart along the lengths of said chord members and located therebetween, the vertical dimensions of said blocks decreasing between high and low ends of the truss,

(c) said means including multiple load carrying webs in spaces between the blocks, each web extending diagonally between said chord members,

(d) said webs including a metallic web extending between two blocks closer to the high end of the truss than a third of the blocks, and non-metallic web means located between the second of said two blocks and said third block, said metallic web having flat ends respectively confined between ends of said two blocs and said chord members, the second of said two blocks having an end portion operatively connected to ends of the metallic web and of the non-metallic web means, the said ends of said metallic web and of the non-metallic web means being located adjacent the side of the lower chord which faces the upper chord.

4,376,363

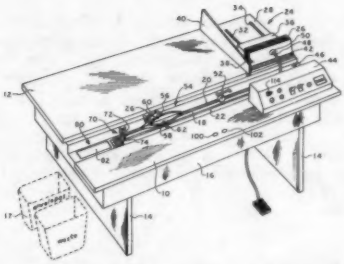
ENVELOPE PROCESSING MACHINE HAVING VISUAL PROCESSING VERIFICATION MEANS

Robert J. Russell, Medford, N.J., assignor to Mail-Ex Corporation, Skokie, Ill.

Continuation of Ser. No. 73,014, Sep. 6, 1979, abandoned. This application May 21, 1981, Ser. No. 266,075

Int. Cl.³ B65B *43/30, 57/18*

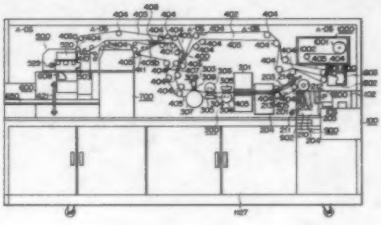
U.S. Cl. 53—52 **12 Claims**



1. A machine for processing envelopes comprising: a processing station with means for opening an envelope, means for feeding envelopes from a supply in one-by-one relation; conveying means with entry and delivery ends receiving envelopes from the feeding means in underlying support at the entry end of the conveying means in predetermined spaced relation and arranged to present each envelope at the processing station to render the same to an opened condition accessible to an operator in one-by-one relation to facilitate the removal of contents from or the insertion of materials into the envelopes by the operator; detecting means spaced from the processing station in the direction of the delivery end of the conveying means a distance sufficient to allow a previously opened envelope to relax toward closed condition at the detecting means for acting upon the conveyed and relaxed envelopes one at a time for sensing a predetermined event corresponding to suspected incomplete removal of the contents from or incomplete insertion of materials into the envelopes; and illuminating means longitudinally proximate to the delivery end of the conveying means with an associated envelope support surface for receiving therefrom and supporting an envelope generally relaxed from its previously opened condition under the moving contact influence of the conveying means and released from support by the conveying means with sliding arrest on the envelope support surface over the illuminating means in stationary positioning on the envelope support surface independent of the moving contact influence of the conveying means in association with the illuminating means which is actuable in response to said detecting means sensing said predetermined event for directing light through the stationary envelope received in association with the illuminating means to afford visual verification of said predetermined event by the operator

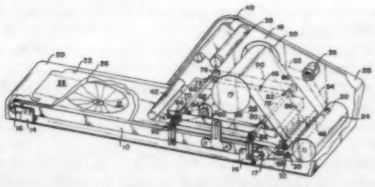
and permissive unobstructed handling of the stationary envelope as the predetermined event may dictate.

4,376,364
SHEET-LIKE MATERIAL SORTING APPARATUS
Shigeo Horino, Tokyo; Shoji Taniguchi, Yokohama, and Hideo Omura, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Aug. 4, 1980, Ser. No. 175,015
Claims priority, application Japan, Aug. 9, 1979, 54-100771
Int. Cl.³ B07C 5/10; G65H 7/12
U.S. Cl. 53—54 **9 Claims**



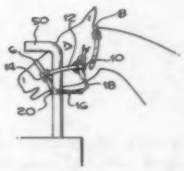
1. A sheet sorting apparatus including:
a supply means for supplying sheets to be sorted;
a take-out unit for sequentially taking out the sheets supplied by said supply means sheet by sheet;
an inspection unit for judging the taken out sheets to permit sorting to be effected into first and second sheets;
a sorting unit for sorting the sheets on the basis of the result of judgement by said inspection unit; and
a collecting unit for collecting the sorted sheets, the improvement comprising:
a read-out unit for reading out the bundled portion of bundled sheets supplied to the supply means, said bundled sheets being comprised of a predetermined number of sheets; and
a card preparing unit for preparing a sorting card according to read out data of the read-out unit so that when sorting is completed with respect to the bundled predetermined number of sheets the bundled predetermined number of sheets can be collected, together with said second sheets, at the collecting unit.

4,376,365
WASTE DISPOSER UNIT
George B. Moertel, R.D. #3, Conneautville, Pa. 16406
Filed Jun. 10, 1980, Ser. No. 158,139
Int. Cl.³ B65B 11/50
U.S. Cl. 53—555 **11 Claims**



1. An animal waste matter disposer unit comprising a generally flat support base having a first portion defining
a waste matter receiving station and a second portion defining a packaging station,
a storage area associated with said packaging station,
said flat support adapted to support an animal on the receiving station,
means for positioning a sheet of sealable material extending along a path at said receiving station to form a bed portion where waste matter is received on said sealable material,
means for moving said sealable material and said waste matter thereon from said receiving station to said packaging station,
means for guiding a sheet of covering material in a first path that angularly intercepts the path of said sheet of sealable material to form a wall portion at said receiving station and then in a second path to overlie said sealable material and said waste matter thereon at said packaging station,
said guiding means adapted to position said covering material at said wall portion to also receive waste matter thereon,
means for sealing adjacent perimeter edges of said covering material and said sealable material at said packaging station whereby said waste matter is encapsulated therebetween to form a sealed package, and
means for moving the sealed package to said storage area.

4,376,366
SAFETY HALTER FOR HORSES
Nathan W. Miller, 15111 Pipeline Ave., Chino, Calif.
Filed Sep. 5, 1975, Ser. No. 610,638
Int. Cl.² B68B 1/02
U.S. Cl. 54—24 **9 Claims**

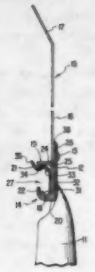


1. In a horse halter, a headstall having first and second overlapping strap end portions, and a breakaway fastener releasably coupling said strap portions together, said breakaway fastener comprising:
a buckle attached to said first strap portion;
a generally U-shaped spring clip having its base part secured within said second strap portion and its legs extending therebeyond, the outer ends of said legs being outwardly turned and also being inclined at a small angle away from the base part of said spring clip;
said buckle having oppositely facing sockets which receive said clip leg ends;
whereby a longitudinal pull of sufficient magnitude upon said second strap portion relative to said first strap portion causes said spring clip legs to bend towards each other, releasing said leg ends from said sockets and said two strap portions from each other.

4,376,367
RAKE
Elsas L. Rocquin, P.O. Box 626, Ponchatoula, La. 70454
Filed Oct. 28, 1981, Ser. No. 315,941
Int. Cl.³ A01D 7/08
U.S. Cl. 56—400.17 **11 Claims**

1. A flexible tine rake having a handle with a cross arm attached thereto and a plurality of flexible tines carried by said cross arm, the improvement wherein:
said cross arm is of generally channel-shaped form in cross section, said tines having end portions projecting into and within the channel section so as to lie across the bottom thereof, and retainer means removably received in the channel for anchoring said end portion of the tines there-

within whereby individual tines may be removed and replaced without the aid of tools, one side of said channel section being slotted to receive said tines, the ends of the



tines within the channel being hooked to conform with the channel contour and said retainer means being resilient to allow the tines to flex over substantial portions of their lengths, inclusive of within the channel.

4,376,368

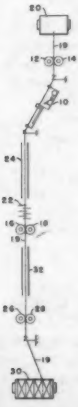
METHOD TO MEASURE YARN TENSION

David B. Wilson, Buffalo, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 23, 1981, Ser. No. 237,235

Int. Cl.³ D02G *1/02;* G01H *13/00;* G01L *5/04*

U.S. Cl. 57—264 **4 Claims**



1. A method of manufacturing a textured yarn comprising the steps of: supplying a running length of continuous filament yarn, heating the yarn, false twisting the yarn after heating, heating the yarn after false twisting the yarn, causing the yarn to vibrate at its harmonic frequency, measuring the harmonic frequency of the yarn being vibrated to determine the tension thereon and taking up the false twisted yarn.

4,376,369

DEVICE FOR CONTROLLING PRIMARY AND SECONDARY AIR/FUEL RATIOS FOR INTERNAL COMBUSTION ENGINE

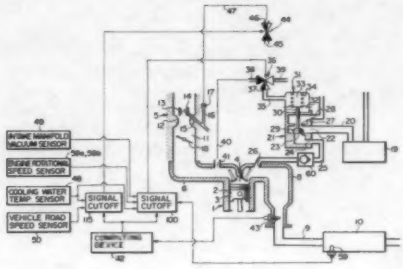
Masafumi Horikoshi; Michikatsu Sato, and Takanori Onishi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 20, 1980, Ser. No. 198,663

Claims priority, application Japan, Feb. 22, 1980, 55-21869

Int. Cl.³ F02N *3/22;* F02B *75/10*

U.S. Cl. 60—276 **4 Claims**



1. For an internal combustion engine for a vehicle, comprising an exhaust manifold, a catalytic converter mounted to said exhaust manifold, an intake manifold, and a carburetor comprising a fuel jet;

an air/fuel ratio control system, comprising:

an oxygen sensor, mounted within said exhaust manifold, which detects the oxygen present within said exhaust manifold and produces a sensor output signal;

a means for computing a corrective signal for controlling the amount of air for air bleeding and secondary air injection based upon said sensor output signal;

a means for supplying secondary air to said exhaust manifold in an amount corresponding to an input signal;

a means for supplying bleed air to said jet of said carburetor in an amount corresponding to an input signal;

a means for feeding said corrective signal to said secondary air supply means and said air bleeding means;

a vehicle road speed sensor which detects whether the road speed of the vehicle is at or above a predetermined first value which indicates that the vehicle is not in a heavily loaded condition;

an engine cooling water temperature sensor which detects whether the temperature of the cooling water of the engine is at or above a predetermined second value which indicates that the engine is in a warmed up condition;

an intake manifold vacuum sensor which detects whether the manifold vacuum is at or above a predetermined third value which indicates that the engine is in idling operation;

a first engine rotational speed sensor which detects whether the rotational speed of the engine is at or above a predetermined forth value which indicates that the engine is at least in stable idling operation;

a second engine rotational speed sensor which detects whether the rotational speed of the engine is at or above a predetermined fifth value which indicates that the engine is above the idling condition; and,

a catalyst temperature sensor which detects whether the temperature of the catalytic converter is within a safe temperature range;

wherein said corrective signal feeding means comprises:

an air bleed signal cutoff device which intercepts the feeding of said corrective signal to said air bleeding means unless the road speed of the vehicle is at or above said predetermined first value and the temperature of the cooling water

of the engine is at or above said predetermined second value; and,

a secondary air signal cutoff device which intercepts the feeding of said corrective signal to said secondary air supply means when at least one of the following four conditions is encountered:

(a) the temperature of the catalytic converter is out of said safe temperature range;

(b) the temperature of the cooling water of the engine is at or above said predetermined second value, the manifold vacuum is at or above said predetermined third value, and the rotational speed of the engine is at or above said predetermined fifth value;

(c) the temperature of the catalytic converter is within said safe temperature range, and the rotational speed of the engine is at or above said predetermined fourth value but is lower than said predetermined fifth value; and,

(d) the temperature of the cooling water of the engine is below said predetermined second value, and the vehicle is not being decelerated and provided further that the following two conditions are met: that the manifold vacuum is at or above said predetermined third value and that the rotational speed of the engine is at or above said predetermined fifth value but not concurrently.

4,376,370

POWER TRANSMISSION FOR AN AUTOMOBILE

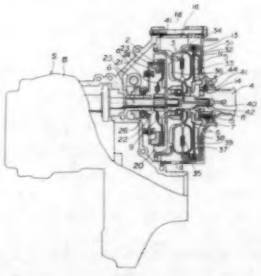
Haruo Kinugasa; Koujirou Hase, both of Ikeda; Shigeru Takeshita, Neyagawa, and Masao Mizue, Kadoma, all of Japan, assignors to Daihatsu Motor Co., Ltd. and Daikin Manufacturing Co., Ltd., both of Osaka, Japan

Filed Sep. 10, 1980, Ser. No. 186,205

Claims priority, application Japan, Sep. 29, 1979, 54-125522

Int. Cl.³ F16D *33/00*

U.S. Cl. 60—337 **11 Claims**



1. A power transmission for an automobile, which transmits power from an output shaft of an engine to an input shaft of a gear transmission, said power transmission comprising:

a housing;

a fluid coupling mounted within said housing and having a pump and a turbine, and a rear chamber at the rear surface side of said turbine;

a clutch mechanism mounted within said housing and having a clutch wheel for selectively transmitting the power from said turbine to said input shaft;

an intermediate shaft supported at both axial ends thereof rotatably by said output and input shafts, said output shaft being provided at its one axial end with a bearing bore for receiving one axial end of said intermediate shaft, said intermediate shaft being inserted and journaled at its said one axial end into said bearing bore, said intermediate shaft rotatably supporting said pump at said fluid coupling, non-rotatably supporting said turbine, and securing said clutch wheel of said clutch mechanism;

a drive plate for transmitting the power from said output shaft to said pump at said fluid coupling, said drive plate being disposed at the rear surface said of said turbine at said fluid coupling and coupled with the outer peripheral portion of said pump;

an oil-charge passageway for charging a part of the lubricating oil for said engine into said fluid coupling, said oil-charge passageway being disposed at said output shaft and communicating at its inlet side with a source of oil supply, said oil-charge passageway including an interconnecting passageway which communicates at its outlet side with said fluid coupling, said oil-charge passageway including an intermediate outlet portion opening into said bearing bore, said interconnecting passageway being open at its inlet side in said bearing bore; and,

an oil-return passageway for returning oil flowing out of said fluid coupling into said engine, said oil-return passageway being disposed at said output shaft and communicating at the inlet side with said rear chamber of said turbine and at the outlet side with the interior of said engine.

4,376,371

HYDRAULIC CIRCUIT FOR A HYDRAULICALLY DRIVEN VEHICLE

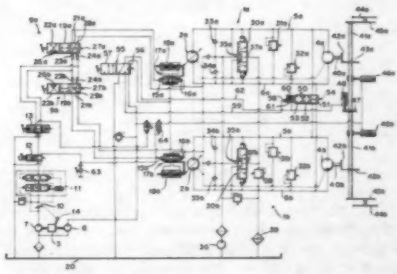
Yasuo Kojima, Yokohama; Koichi Morita, Isehara; Kenzo Hoashi, Yokohama, and Taketo Aruga, Isehara, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,382

Claims priority, application Japan, Oct. 9, 1979, 54-139088

Int. Cl.³ F15B *13/09*

U.S. Cl. 60—420 **3 Claims**



1. In a hydraulic circuit for a hydraulically driven vehicle including a pair of variable displacement hydraulic pumps each driven by a common engine, a pair of hydraulic motors each connected with said respective variable displacement hydraulic pumps in a closed loop and driven thereby, each closed loop comprising first and second conduits connected together, and a pair of servo control means each for controlling the displacement of said respective variable displacement hydraulic pumps, the improvement comprising:

a pair of steering valve means each for controlling said respective servo control means and hence steering of the vehicle and having formed therein a neutral position, a forward position and a reverse position and being normally held in the forward position;

a straight run compensator valve means disposed between said pair of closed loops, said straight run compensator valve means having formed therein a neutral position where all of the first and second conduits of said closed loops are connected with each other, a communication position where the pair of first conduits of said closed loops are connectible with each other and the pair of second conduits of said closed loops are connectible with each other and a shut-off position where communication between said pair of closed loops is blocked;

a selector valve means operatively linked with said steering

valve means for controlling said straight run compensator valve means, said selector valve means having formed therein a first position and a second position and being held in said first position when both of said steering valve means remain their forward positions but changed over to said second position when one of said steering valve means is shifted to the neutral position or to the reverse position; and

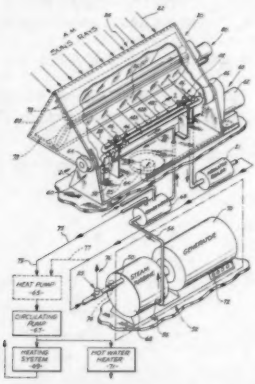
means for shifting said straight run compensator valve means to the communication position when said selector valve means is held in the first position and to the shut-off position when said selector valve means is shifted to the second position.

4,376,372

SOLAR ENERGY CONVERSION APPARATUS

Edgar English, Jr., 45125 Redwood Ave., Lancaster, Calif. 93534

Filed Jun. 2, 1980, Ser. No. 155,795
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641.15 10 Claims



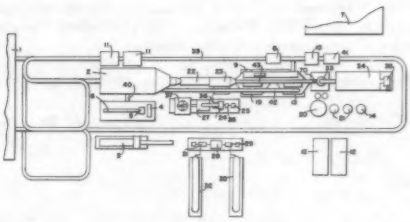
1. An improved solar energy conversion apparatus for effectively converting solar radiation thermal energy, on a high-efficiency basis, into stored thermal energy contained in a captive working medium in a closed-cycle power conversion system, comprising: radiation-concentrating and line-focusing optical means operable to receive solar radiation as input energy in a relatively large area input region and in relatively diffuse form and to modify same into concentrated output radiation of an effectively high thermal energy density in a relatively smaller area concentrated heat transfer region of a line configuration whereby to have effectively greatly reduced the radiation area; heat transfer and energy conversion means positioned in said heat transfer region of line configuration and having an outer radiation reception surface adapted to be impinged by said area-reduced, effectively energy-density-concentrated output radiation from said radiation-concentrating optical means and having a thermally efficient radiation-to-heat conversion layer operable to convert a large portion of received concentrated infrared radiation into heat in a containment region on the inner side of said surface and in a working medium contained therein, said radiation reception surface being thermally conductively provided with and attached to a closed-cycle containment apparatus having an inner contact surface and having a working medium contained against said inner contact surface thereof, said closed-cycle containment apparatus comprising a number of series-connected hollow flow sections provided with intervening one-way check valve means therebetween allowing the passing of a progressively heated working medium through said valve means and the corresponding flow sections of said containment apparatus in one forward direction only; succeeding flow sections of said containment apparatus between succeeding sets of said one-way valve means being placed for individual reception of corresponding different quantities of line-focused solar radiation for incremental heating in a series manner of the working medium in successive flow sections of the containment apparatus whereby to incrementally increase the temperature and pressure of the working medium along the complete length of said containment apparatus until it reaches a desired high temperature and pressure at a thermal-energy-output-utilization end thereof adapted to be connected to some desired form of thermal energy utilization apparatus adapted to effectively reduce the temperature and pressure of the working medium as a consequence of the effective extraction of substantial quantities of energy from the working medium by such utilization apparatus; and a return flow line adapted to be connected from an output side of such a thermal energy utilization apparatus back to a low-thermal-energy input end of said containment apparatus.

4,376,373

ENERGY RECOVERY SYSTEM

Roy Weber, P.O. Box 336, and Bruce C. Huddleston, 865 N. Kalaheo Ave., both of Kailua, Oahu, Hi. 96734

Filed Feb. 18, 1981, Ser. No. 235,489
Int. Cl.³ F01K 17/00
U.S. Cl. 60—648 66 Claims



1. Energy recovery system comprising

an incinerator configured to burn scrap material comprising metal,

afterburner means connected to the incinerator for oxidizing products of incomplete combustion from the incinerator,

heat collection means connected to the afterburner for converting thermal energy contained in the oxidized products into steam,

electricity producing means connected to the heat collection means for converting the steam into electric current, and

metal refining means for refining metal from the incinerated scrap material, said refining means being powered solely by electrical current produced by the electricity producing means.

4,376,374

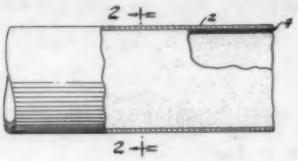
METAL-CERAMIC COMPOSITE AND METHOD FOR MAKING SAME

Bruce E. Bothwell, Zurich, Switzerland, assignor to Repwell Associates, Inc., Bloomfield Hills, Mich.

Division of Ser. No. 852,128, Nov. 16, 1977, Pat. No. 4,276,331, which is a division of Ser. No. 652,008, Jan. 26, 1976, Pat. No. 4,059,712. This application Jan. 19, 1981, Ser. No. 225,937
Int. Cl.³ F01N 3/10
U.S. Cl. 60—687 2 Claims

1. An insulated component for an internal combustion engine comprising: a cast metal engine component wall that is heated during engine operation; a metal-ceramic liner of a hollow shape about which the wall extends in direct engagement therewith; said metal wall being cast about said hollow metal-ceramic liner with the liner in situ; said metal-ceramic

liner including a monolithic layer of ceramic material formed from a slurry and having imbedded therein a metal grid including openings which are closed by said ceramic material; and



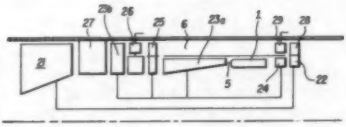
said metal grid having a melting temperature higher than the temperature at which the slurry forms into said monolithic ceramic layer and having a higher coefficient of thermal expansion than the ceramic material.

4,376,375

MULTIPLE FLOW TURBOJET WITH ADJUSTABLE BYPASS RATIO

Serge Boudigues, Sceaux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.-M.A., Paris, France

Filed Jul. 16, 1980, Ser. No. 169,465
Claims priority, application France, Jul. 16, 1979, 79 18317
Int. Cl.³ F02K 3/06
U.S. Cl. 60—226.3 **6 Claims**



1. A multiple flow turbojet with an adjustable bypass ratio for a fluid, said turbojet comprising a housing containing:
- a low pressure rotary spool including at least one turbine and one compressor;
- a high pressure rotary spool including at least one turbine and one compressor;
- burner means acting on the turbine of at least said high pressure spool;
- a primary fluid path defined by said low and high pressure spools and said burner means;
- a secondary fluid path radially outside of said primary fluid path;
- at least one vane in said secondary fluid path, said vane mechanically integral with said high pressure spool and interacting with said fluid; and
- at least one adjustable guide means in said secondary fluid path;
- whereby the ratio of fluid flow characteristics in said primary and second fluid paths is varied as a function of the setting of said at least one guide means.

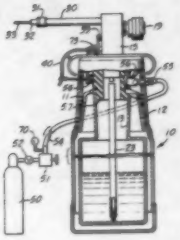
4,376,376

CRYOGENIC DEVICE OPERABLE IN SINGLE OR DUAL PHASE WITH A RANGE OF NOZZLE SIZES AND METHOD OF USING THE SAME

Harold D. Gregory, West Covina, Calif., assignor to Virginia M. Gregory, West Covina, Calif.

Filed May 12, 1980, Ser. No. 148,828
Int. Cl.³ A61B 17/36
U.S. Cl. 62—51 **23 Claims**

22. In a cryogenic device:
- a container for normally pressurized liquid cryogen;
- an expansion chamber connected to said container to receive liquid cryogen therefrom;
- a nozzle having an internal diameter between 0.010 inches and 0.045 inches;
- first means to reduce the pressure in said expansion chamber to effect an increase in the flow of pressurized liquid cryogen into said chamber from said container and to change the flow of fluid from said chamber through said nozzle from single phase to dual phase with said nozzle



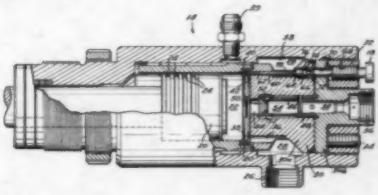
having a diameter in the range of 0.010 inches to 0.021 inches; and
- second means to provide gas under pressure to said chamber to raise the pressure therein to approximate the pressure present when a smaller nozzle with a nozzle connected having a diameter in the range of 0.033 inches to 0.045 inches is connected in order to effect a flow of single phase gas through said nozzle, said flow changing from single phase to dual phase upon the substantial closing of said second means and the opening of said first means.

4,376,377

UNLOADING SYSTEM FOR CRYOGENIC PUMPS

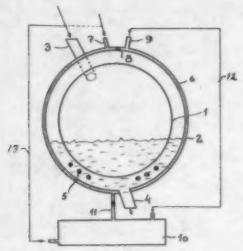
Paul P. Duron, Corona Del Mar; Charles E. Tellez, Alta Dena, and Robert D. Lutjens, Hacienda Heights, all of Calif., assignors to Cryomec, Inc., Anaheim, Calif.

Filed Apr. 3, 1981, Ser. No. 250,582
Int. Cl.³ B01D 8/00
U.S. Cl. 62—55.5 **21 Claims**



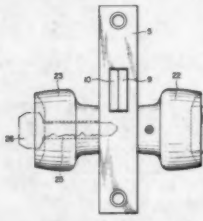
1. An unloading system for deactivating a pump, comprising:
- a chamber;
- an inlet valve for admitting a liquid into said chamber, said liquid having an inlet pressure;
- means in said chamber for pumping said liquid,
- an outlet valve for discharging said liquid from said chamber; and
- means responsive to said inlet pressure for selectively opening said inlet valve during the pumping of said liquid to prevent said liquid from being discharged through said outlet valve.

4,376,378
HEAT EXCHANGER
Ole N. Svenningsen, Odense, Denmark, assignor to Volund Vaskerimaskiner A/S, Tommerup, Denmark
Filed Nov. 14, 1980, Ser. No. 206,984
Claims priority, application Denmark, Dec. 6, 1979, 5191/79
Int. Cl.³ D06F 21/04, 39/04, 39/08
U.S. Cl. 68—16 7 Claims



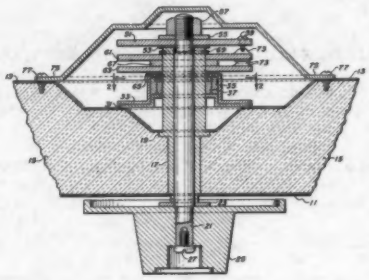
1. In a drum type washing machine wherein a perforated cylindrical washing drum is suspended for rotation about a substantially horizontal axis within a cylinder-shaped tank, said tank having at least one inlet for cold water and one outlet for discharging waste washing water, and heating means for heating the water within said tank, the improvement comprising, said tank being constructed as a double-walled tank to provide an inner and an outer wall and a space between the two walls, an inlet and an outlet near the top of the tank through the outer wall thereof communicating with said space, and a partition between said inner and outer walls within said space near the top of said tank and between said inlet and outlet so that water entering the inlet to said space passes through said space around the bottom of said tank to the outlet to said space.

4,376,379
LOCKING DEVICE
Motohiro Gotanda, No. 1802-10, Nakabyo Abiko City, Chiba Prefecture, Japan
Filed Aug. 20, 1980, Ser. No. 179,824
Claims priority, application Japan, Aug. 23, 1979, 54-106651
Int. Cl.³ E05B 63/14
U.S. Cl. 70—118 6 Claims



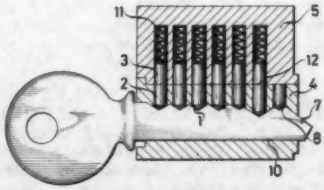
1. In a locking device of the type comprising driving members driven by a thumb turn from inside a room and by a key from outside the room, dead bolts brought into engagement with the driving members to advance or retreat to lock or unlock the room, and switches for detecting the advance and retreat of the dead bolts, the improvement wherein said dead bolts are formed by dividing the thickness of a dead bolt into two parts and said driving members are formed by dividing the thickness of a driving member into two parts, said dead bolts being brought into engagement with said driving members to advance or retreat, and one of said driving members is driven by the thumb turn and the other by the key; said device further comprising a first engaging means for providing that said driving member driven by the thumb turn is rotated integrally with the other driving member driven by the key only when the key is rotated to lock the room, and a further engaging means for providing rotation of the driving member driven by the key integrally with the other driving member driven by the thumb turn when the room is unlocked after having been locked from the inside by means of said thumb turn.

4,376,380
COMBINATION LOCK
George M. Burgess, Webster, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.
Continuation-in-part of Ser. No. 118,735, Feb. 5, 1980, abandoned. This application Jan. 21, 1981, Ser. No. 226,717
Int. Cl.³ E05B 37/08
U.S. Cl. 70—303 A 18 Claims



1. A combination lock for mounting on a heat resistive panel such as a safe door, comprising an operating dial on one side of said panel, movable lock mechanism on an opposite side of said panel, a spindle extending through the thickness of said panel and operatively connecting said dial to said movable lock mechanism, and a bushing surrounding said spindle, characterized by the fact that both said spindle and said bushing are formed of non-metallic material having relatively low heat conductivity, so that in case of a fire on one side of said panel, said spindle and bushing will not provide an efficient path for transmission of heat to the other side of the panel.

4,376,381
LOCK
Frank Muus, Moss, Norway, assignor to Elkem A/S, Oslo, Norway
Filed Nov. 13, 1980, Ser. No. 206,357
Claims priority, application Norway, Nov. 29, 1979, 793880
Int. Cl.³ E05B 11/00, 27/06, 35/08
U.S. Cl. 70—337 3 Claims



1. A pin tumbler lock and first and second keys therefor comprising:
(a) a pin tumbler lock including:
(i) an outer cylinder;

(ii) an inner cylinder rotatably mounted in said outer cylinder;
(iii) said inner cylinder having a keyway adapted to receive a first key and a second key therein;
(iv) a single row of parallel bores disposed in said inner cylinder, each said bore having a lower tumbler pin disposed therein;
(v) said outer cylinder having a first row and a second row of parallel bores disposed therein, the number of bores in said first row being at least one greater than the number of bores in said second row, said first and second rows defining a first position and a second position of said inner cylinder wherein the bores of said inner cylinder are coaxial with the bores in the respective rows of the outer cylinder;
(vi) each of said bores in said outer cylinder having upper tumbler pins respectively disposed therein;

(b) a first key, said first key having notches thereon adapted for positioning said lower tumbler pins in said inner cylinder, said lower tumbler pins engaging corresponding notches for enabling rotation of said inner cylinder and at least one of said lower tumbler pins engaging a corresponding one of said notches for preventing retraction of said first key except when said inner row of bores in said inner cylinder is aligned with said first row of bores in said outer cylinder; and

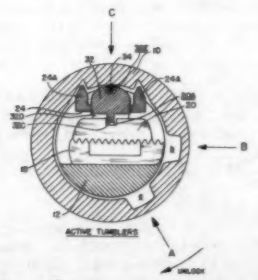
(c) a second key, said second key having notches thereon for engaging each lower tumbler pin except said at least one of said lower tumbler pins so that said second key may be retracted when the row of bores in said inner cylinder is aligned with said bores in the outer cylinder both at said first position and said second position.

4,376,382

RESETTABLE LOCK ASSEMBLY

James W. Raymond, 104 Via Lido Soud, Newport Beach, Calif. 92663, and James A. Millett, Costa Mesa, Calif., assignors to James W. Raymond, Costa Mesa, Calif.

Filed Dec. 1, 1980, Ser. No. 211,729
Int. Cl.³ E05B *25/00, 29/04, 35/08, 35/10*
U.S. Cl. 70—338 5 Claims



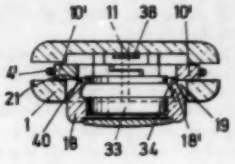
1. A lock assembly including: a barrel; a plug rotatably mounted in said barrel; a plurality of flat follower members positioned on said plug in spaced parallel relationship along said plug and extending across said plug, each of said follower members having a serrated edge; and at least two flat tumblers, each having a serrated edge, positioned adjacent to one another on the serrated edge of each of said follower members to be individually settable to independent positions with respect to the corresponding follower member.

4,376,383

COUPLING MEMBER FOR THE SUSPENSION OF A KEY RING

Heinz Wolter, Meiswinkel 3, 5067 Kürten, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 244,187
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012607
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—456 R 10 Claims



1. In a coupling member for attachment of a key ring, provided with an eye or the like arranged in the vicinity of one end for the attachment of a key ring, and having at an opposite end a mouth formed by two tong jaws which jaws come together in tong-like fashion and which jaws project out beyond a housing-like middle piece, the mouth having an interior space and defining an opening cross-section, the opening cross-section, the interior space of the mouth and the eye being arranged one behind the other on a longitudinal axis of the middle piece, the improvement comprising

one common pivot pin mounted in said middle piece,

both of said tong jaws are pivotally mounted on said one common pivot pin,

return spring means for spring-biasing said jaws into a closing position thereof,

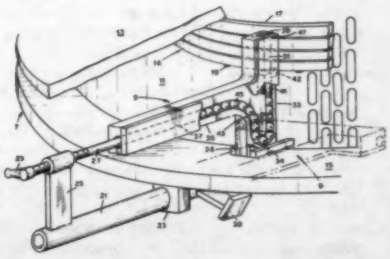
means comprising actuating surfaces which are mounted between said eye and said mouth and pressably-in transversely to said longitudinal axis of the middle piece for displacing said jaws in an opening direction against said spring-biasing.

4,376,384

CLAMP FOR USE IN WINDING LARGE MAGNET COILS

Robert L. Brown, Kingston, and Walter J. Kenney, Clinton, both of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 5, 1981, Ser. No. 260,624
Int. Cl.³ B21F *3/02*; B25B *5/14*
U.S. Cl. 72—135 10 Claims



1. Apparatus for applying force to turns of a helical coil wound about a rotatable support, comprising:

a rigid member having an axis, said member being mounted to rotate with said support and being arcuately movable about an axis parallel with the axis of said member, said member having a face confronting said turns for compressing said

turns against said support, said face being formed with a groove extending transversely of said turns,

a longitudinally extending passage in said member connected to said groove to form therewith a continuous guideway for rollable articles,

a rigid lug mounted in said groove for longitudinal movement therein and having a projection which extends laterally from said groove, said projection having an end face confronting said hub and having a lateral face confronting a face of the last-formed turn of said coil,

a train of rollable articles in said guideway inwardly of said lug for movement therein, and

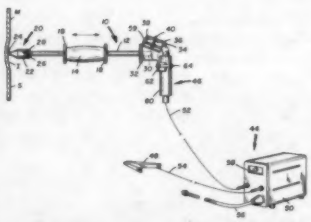
means for applying force to the end of said train relatively remote from said lug to urge said lateral face thereof against said face of the last-formed turn of said coil to displace said turn along the face of said support; the force so applied to said lug being translated, up cessation of the displacement of said turn, to a force which urges said face of said member against said turns to compress them against said support.

4,376,385

SLIDE HAMMER HAVING SPOT WELDABLE SURFACE ENGAGING CAPABILITY

Michael G. Davis, 2902 White Ave., Baltimore, Md. 21214

Filed Sep. 24, 1980, Ser. No. 190,633
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—479 **12 Claims**



1. A tool for recontouring metal used in conjunction with an electrical welding apparatus comprising:

shaft means for contacting said metal, said shaft means comprising a rod including tip means, said shaft means contacting said metal through said tip means;

means for imparting forces to said shaft means which are transferred thereby to said metal when said shaft is in contact therewith, said force imparting means imparting force directly to said shaft means, said force imparting means comprising a weight having an opening disposed therethrough, said weight being slidably disposed on said rod with said rod passing through said opening, stop means being disposed on said rod adjacent to the end thereof opposite said tip means, sliding of said weight along said rod toward said stop means and the collision of said weight with said stop means imparting a tension force on said rod when said rod is fixedly secured to said metal; and

means for electrically connecting the portion of said shaft means which contacts said metal to said electrical welding apparatus, said shaft means when so connected being the electrode of said welding apparatus, activation of said welding apparatus welding said shaft means directly to said metal;

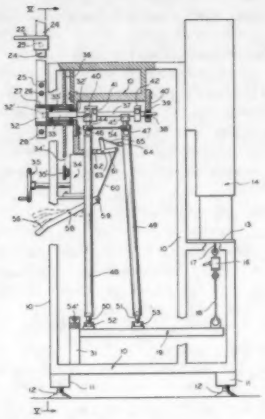
said shaft means being removable from said metal as an integral portion of said tool subsequent to said electrical connection of said shaft to said metal.

4,376,386

TORQUE WRENCH TESTING DEVICES AND THE LIKE

Talmage O. Green, Schaumburg, Ill., assignor to Precision Instruments, Inc., Des Plaines, Ill.

Filed Nov. 19, 1979, Ser. No. 95,294
Int. Cl.³ G01L *25/00*
U.S. Cl. 73—1 C **12 Claims**



1. A self-contained measuring and testing device comprising a frame, a calibrated measuring instrumentality with multiple scales to register the load applied by a single scale calibrated work engaging device under test, said work engaging device being calibrated to correspond with one of said multiple scales on said measuring instrumentality, loadable means on said frame to receive said calibrated work engaging device for applying a load to a selected scale on said calibrated measuring instrumentality, fixed multiple sets of fulcrums on said frame, displaceable fulcrum complements on said frame to confront different sets of said fixed fulcrums, and moveable linkage connected to said displaceable fulcrum complements to effect the shifting thereof to confront different sets of fixed fulcrums to vary the ratio of input load applied by said calibrated work engaging device to said multiple calibrated measuring instrumentality so that calibrated work engaging devices of varying calibrations may be tested against a corresponding scale on said multiple scale calibrated measuring instrumentality to check the accuracy of said calibrated work engaging device.

4,376,387

DYNAMIC SHOCK ABSORBER EVALUATOR

Bernard Stevens, Limal, Belgium, and Gregg W. Squires, Sparkill, N.Y., assignors to Products and Patents Ltd., New York, N.Y.

Filed Jul. 24, 1980, Ser. No. 172,000
Int. Cl.³ G01M *17/04*
U.S. Cl. 74—11 **19 Claims**

1. Apparatus for evaluating the dampening proficiency of a shock absorber on a spring suspended body mass of a wheeled vehicle relative to a non-suspended wheel supported mass of the vehicle without necessitating removal of the shock absorber from its operating environment, comprising:

means for initially substantially vertically displacing only the suspended body mass of the vehicle a predetermined distance from its rest position relative to the non-suspended wheel supported mass without displacing the wheels or the wheel supported mass of the vehicle;

means for quickly releasing the displaced suspended body mass from its displaced position relative to the non-suspended wheel supported mass;

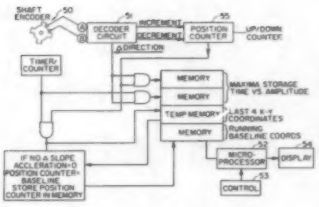
sensing means for sensing the resulting oscillating movement

of the released suspended body mass relative to the non-suspended wheel supported mass and for generating a signal which is a function of the sensed resulting oscillating movement;

means coupled to said sensing means for processing and evaluating said signal corresponding to the movement of the released suspended body mass sensed by said sensing means;

said processing and evaluating means comprising means for determiming the timing of, and suspended mass displacements at, the maxima and minima of the oscillation of the released suspended body mass; and evaluating means coupled to said determing means for evaluating the difference between adjacent maxima and/or minima, said evaluating means including means responsive to the determined timing and displacements at said maxima and minima of oscillations of the released suspended body mass for generating at least three quality factors (h_1: amount of expansion; h_2: amount of compression; and h_3: total damping) which correspond to the damping proficiency of the shock absorber under test; and

display means coupled to said processing and evaluating means for displaying said at least three quality factors (h_1, h_2, h_3), thereby displaying the evaluation of the dampening proficiency of the shock absorber.



14. A method for evaluating the dampening proficiency of a shock absorber on a spring suspended mass relative to a non-suspended mass of a wheeled vehicle without necessitating the removal of the shock absorber from its operating environment between the suspended and non-suspended masses, comprising:

(a) raising the suspended mass relative to the non-suspended mass, without displacing the non-suspended mass or the wheels of the vehicle,

(b) releasing quickly and safely the raised suspended mass to permit it to drop relative to the non-suspended mass,

(c) sensing the resulting oscillating movement of the suspended mass relative to the non-suspended mass over a period of time following release of the suspended mass from its raised position, and generating a signal which is a function of the sensed resulting oscillating movement of the suspended mass,

(d) processing and evaluating the signal corresponding to the oscillating movement of the released suspended mass relative to the non-suspended mass sensed,

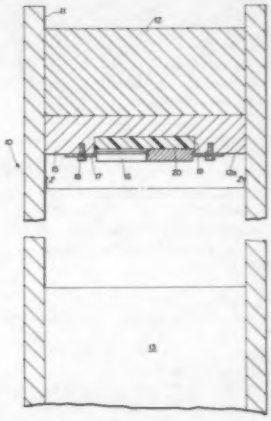
(e) said processing and evaluating step comprising determining the magnitudes of the maxima and minima of the oscillation of the released suspended mass, determining the timings of said maxima and minima, and evaluating the difference between adjacent maxima and/or minima and generating at least three quality factors (h_1: amount of expansion; h_2: amount of compression; and h_3: total damping) which correspond to the damping proficiency of the shock absorber under test; and

(f) displaying the evaluation of the dampening proficiency of the shock absorber.

4,376,388
SHOCK SIMULATOR

William G. Soper, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1981, Ser. No. 242,199
Int. Cl.³ G01N *19/00, 3/30*
U.S. Cl. 73—12 **10 Claims**



1. A device for simulating a shock pulse on a projectile, comprising:

means for stationarily positioning the projectile to receive a direct impact;

means for directly impacting the projectile, and means for directly impacting mounted in spaced apart relationship with the projectile; and

means for producing a shock pulse on the projectile from the direct impact thereon, said means for producing the shock pulse mounted to said means for directly impacting and positioned between said means for directly impacting and the projectile.

4,376,389
METHOD OF DIAGNOSIS OF OPERATING CONDITIONS OF BEARING AND APPARATUS THEREFOR

Tomoaki Inoue; Kinpei Okano; Kazuo Ikeuchi, and Tsuguaki Koga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

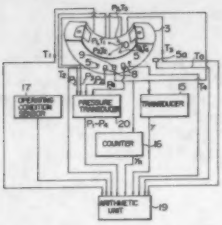
Filed Nov. 25, 1980, Ser. No. 210,171
Claims priority, application Japan, Nov. 26, 1979, 54-152093
Int. Cl.³ G01M *13/04*
U.S. Cl. 73—118 **21 Claims**

1. A method of diagnosis comprising the steps of:

detecting values representing the conditions of the bearing indicative of the behavior of the bearing journalling a rotary shaft, including detecting pressures of an oil film formed by lubricant on a sliding surface of the bearing at a plurality of points on the sliding surface as values representing one condition of the bearing;

diagnosing at least one of the operating conditions of the bearing and abnormality in the bearing based on the detected values of the conditions of the bearing including calculating the pressure differentials between the plurality

of values of oil film pressures detected at the plurality of points; and calculating the deflection of the bearing with respect to the rotary shaft based on the calculated oil film pressure differentials, to thereby diagnose the operating conditions of the bearing.

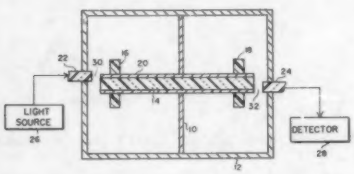


4,376,390

FIBER OPTIC ANGULAR ACCELEROMETER

Glen A. Rines, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 20, 1981, Ser. No. 245,805
Int. Cl.³ G01P 15/08
U.S. Cl. 73—517 A 32 Claims



1. A fiber optic angular accelerometer, comprising:

a flexible member;

an optical fiber attached to said flexible member intermediate the ends of the optical fiber such that each end of said optical fiber moves in response to the flexing of said flexible member;

means for coupling light to one end of said optical fiber; and

means for coupling light from the other end of said optical fiber, whereby angular accelerations will occasion a flexing of said member causing said optical fiber to pivot and thereby alter the coupling of light thereto and therefrom.

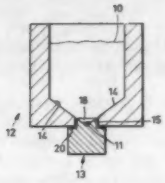
4,376,391

DEVICE FOR PREPARING DISSOLVED SUBSTANCES FOR MASS-SPECTROMETRIC ANALYSIS

Curt Brunnee, Platjenwerbe, Fed. Rep. of Germany, assignor to Finnigan Mat GmbH, Bremen, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,280
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007538
Int. Cl.³ G01N 35/02
U.S. Cl. 73—863.12 15 Claims

1. Device for preparing fractions separated in a liquid chromatograph including substances dissolved in solvents for mass-spectrometric analysis after evaporation of the solvents by direct introduction into an ionization chamber of a mass spectrometer comprising: a relatively large dimensioned collecting vessel (12) adapted to hold a separated fraction, and a relatively small dimensioned sample holder (13) removably disposed within said collecting vessel and forming a portion of the inner surface thereof, whereby the sample holder and any substance (11) left therein in the form of a residue after solvent evaporation may be removed from the collecting vessel and directly introduced into a mass spectrometer for further analysis.

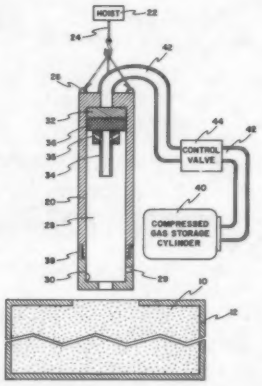


4,376,392

VISCOUS SLUDGE SAMPLE COLLECTOR

George A. Beitel, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 11, 1981, Ser. No. 291,898
Int. Cl.³ G01N 1/08
U.S. Cl. 73—864.45 10 Claims



1. A vertical core sample collection system for viscous sludge, comprising:

(a) a housing having a right-circular, cylindrical bore, said bore having an upper end and a lower end, said lower end leading outside said housing, having a transverse vent, and terminating in a transversely and inwardly projecting annular rim, and said housing movable so that said bore is generally vertically disposable with said bore's lower end proximate said sludge to be sampled;

(b) a movable piston coaxially disposed in said bore and having an upper position proximate said bore's upper end;

(c) a hollow sample tube coaxially disposable within, and substantially shorter than, said bore, said tube having an upper terminus, with a side vent, attachable to said piston, a lower terminus, and having a transversely and outwardly projecting flange, engageable with said rim, attached to said tube proximate said tube's upper terminus, said tube having an initial position disposed within said bore with said upper terminus attached to said piston and with said piston disposed at its upper position and said tube having a final position with said lower terminus disposed outside said bore in said sludge and with said flange disposed inside said bore contacting said rim, with said tube guidable by said flange from said initial position to said final position;

(d) means for temporarily holding said tube at its initial position, when said bore is generally vertically disposed, prior to moving said tube to its final position; and

(e) means for rapidly accelerating said tube, by accelerating said piston, from said tube's initial position to said tube's final position such that when said tube's lower terminus reaches said sludge, said tube has a sufficient velocity to penetrate said sludge and obtain a full-length sludge sample, which retains strata information, before said tube stops with said flange stopped against said rim.

4,376,393

CONNECTING ROD OF RADIAL PISTON MOTOR AND METHOD OF PRODUCING SAME

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed Jul. 2, 1980, Ser. No. 165,328

Claims priority, application Japan, Dec. 28, 1979, 54-181683[U]; Dec. 28, 1979, 54-181684[U]

Int. Cl.³ G05G 1/00; F16C 9/04

U.S. Cl. 74—579 R 2 Claims

1. In a connecting rod of a radial piston motor having a spherical portion, a rod portion and a curved pad having a thickness T and an internal diameter D,

the improvement wherein said rod portion (2) is solid and provided at its one end with a recess (6), said pad (3) being a composite bearing constituted by a metallic backing layer and a bearing alloy layer on said backing layer, said backing layer being provided on its surface adjacent to said rod portion with a projection (7,14), said rod portion and said backing layer being joined to each other by electron beam welding at the joint therebetween with said projection fitting in said recess formed in said rod portion; wherein said projection (14) extends from a large projection (13) of diameter substantially equal to the diameter of said rod portion, said electron beam welding at the joint being between said large projection and said rod portion.

4,376,394

MANUALLY OPERABLE MULTI-SPEED BICYCLE TRANSMISSION

Fernand S. Lapeyre, 1224 Octavia St., New Orleans, La.

Continuation-in-part of Ser. No. 968,989, Dec. 13, 1978, Pat. No. 4,305,312. This application Feb. 13, 1981, Ser. No. 234,427

Int. Cl.³ F16H 3/44

U.S. Cl. 74—750 B 8 Claims

1. A manually actuatable multi-speed transmission for bicycles, comprising

a pedal shaft rotatably displaceable within the pedal shaft hub of a bicycle frame,

a plurality of drive gears rotatably mounted on said pedal shaft,

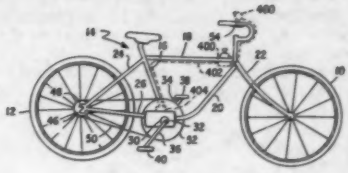
displaceable pawl means for connecting each of said drive gears into selective driving engagement with said pedal shaft,

collar means mounted on said pedal shaft within said pedal hub for rotation in conjunction therewith and permitted longitudinal displacement therealong,

bidirectionally displaceable cable means manually actuatable at one end thereof by a bicycle rider,

means engageable with said collar means and responsive to predetermined cable displacement for displacing said collar means longitudinally of said pedal shaft, and

means responsive to the positional location of said collar



means longitudinally of said pedal shaft for selectively displacing said pawl means to effect the selected connection of said drive gears into driving engagement with said pedal shaft.

4,376,395

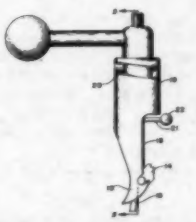
TOOL FOR USE IN ADJUSTING ENGINE VALVES

Brent K. Hoffman, 788 W. Bullion St., Murray, Utah 84107

Filed Feb. 20, 1981, Ser. No. 236,209

Int. Cl.³ B25B 9/00

U.S. Cl. 81—3 R 10 Claims



1. A tappet adjusting tool for use in replacing the adjusting pads in the valve lifters of overhead cam type internal combustion engines, comprising a main tool body having a lower extension adapted to fit loosely between the cylinder head and the cam of an internal combustion engine; a wedge member pivoted in the main tool body extension so as to be normally swung in toward the main body and such that the extension can easily be placed between the cam and the cylinder head; means for locking the wedge into biased position against the cylinder head when the extension is in position between the cam and cylinder head; plunger means associated with the tool body; and means for extending said plunger means from the body extension so as to move the lifter and the adjusting pad of the engine being worked on away from the cam, so that the adjusting pad can be removed.

4,376,396

RETAINING AND BRAKING APPARATUS FOR USE WITH POWERED ROTATIONAL FORCE APPLICATOR TOOL

Michael Hayhoe, 2918 Allenby Rd., R.R. 6, Duncan, British Columbia, V9L 4T8, Canada

Filed Mar. 12, 1981, Ser. No. 243,256

Int. Cl.³ B25B 17/00

U.S. Cl. 81—57.14 11 Claims

1. A powered tool for applying rotational force to a turnbuckle comprising:

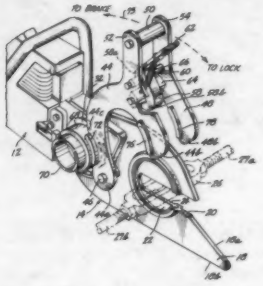
a power drive means;

a tool head mounted to said power drive means, said tool

head having a first slot formed therein adapted to permit passage of said turnbuckle therethrough;

a force application disc mounted in said tool head for applying rotational force to said turnbuckle, said disc having a second slot formed therein adapted to receive said turnbuckle, said second slot being formed in the perimeter of said disc and extending radially past the center of said disc, said disc being mounted for rotational movement in said tool head;

power transmission means associated with said power drive



means and said tool head for transmitting power from said power drive means to said disc so as to tend to rotate said disc;

retaining and braking means mounted on said tool head for selective movement between a first position adjacent said first slot and a second position spaced from said first slot, said retaining and braking means when in said first position cooperating with said tool head to prevent passage of said turnbuckle through said first slot and when in said second position cooperating with said power transmission means to oppose rotation of said disc.

4,376,397

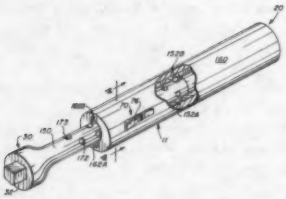
APPARATUS FOR VARIABLY SPACING A DRIVING TOOL AND A DRIVEN TOOL

Robert A. Newby, 2339 N. 30th Pl., and Gregg E. York, 2101 N. 28th St., both of Phoenix, Ariz. 85008

Filed Feb. 13, 1981, Ser. No. 234,363

Int. Cl.³ B25B *23/16*; B25G *1/04*; F16B *7/14*

U.S. Cl. 81—177 A **2 Claims**



1. An adjustable extension, comprising:

driver socket means for engaging a driving tool;

driven socket means for engaging a driven tool; and

adjusting means for coupling said driver socket means and said driven socket means and further for permitting a controllably variable spacing of said driver socket means and said driven socket means, said adjusting means comprising lever means for permitting a reversible transmission of torque from said driver socket means to said driven socket means, said lever means comprising:

a male member having a longitudinal axis, an arcuate surface symmetrically disposed about said axis, and at least a first pin projecting laterally from said surface;

a female member having a longitudinal aperture slidably disposed about said male member,

said female member further having a first logitudinal slot provided with a continuous opening to said aperture so that said pin is at least selectively free to translate in said slot;

said female member further having a plurality of second slots individually having an opening to said first slot and further individually having incremental spacing along the surface of said logitudinal aperture so that said pin can be inserted in a particular one of said second slots by rotating said male member with respect to said female member to establish a fixed rotational relationship between said male and female members, said second slots each having a first portion open to said first slot and a second portion orthogonally disposed to said first portion, said lever means comprising retaining means for selectively retaining said pin at the terminus of one of said second slots, said adjusting means comprising said pin and said plurality of second slots, said adjusting means comprising locating means for releasably aligning said pin with one of said second slots, said retaining means comprising:

said female member having a latch member

said female member further provided with spring means for biasing said latch member against the surface of said male member; and

a first plurality of detents spaced along the length of said male member so that the entry of said latch member into one of said detents firmly locates said pin at said terminus, aid locating means comprising a second plurality of detents located along the length of said male member so that entry of said latch member into one of said second plurality of detents locates said pin within said first slot at the opening to one of said second slots.

4,376,398

BAR FEED

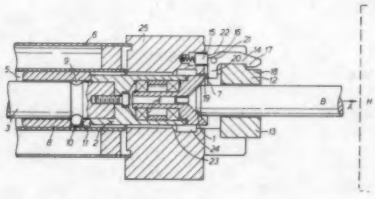
Douglas S. Love, Hartfield, England, assignor to E M I Limited, Hayes, England

Filed Aug. 29, 1980, Ser. No. 182,591

Claims priority, application United Kingdom, Sep. 3, 1979, 7939510

Int. Cl.³ B23B *13/02, 13/08*

U.S. Cl. 82—2.5 **4 Claims**



1. A bar stock feed arrangement comprising a housing having an axial bore, a pusher rod adapted to engage bar stock and a drive means for moving the pusher rod along the bore to thereby advance the bar stock, a plurality of removable support blocks capable of being maintained in a configuration appropriate for supporting bar stock protruding from the housing, a plurality of symmetrically disposed levers pivotably mounted to said housing, and means for resiliently biasing each lever to urge the support blocks into their supportive configuration, the arrangement also comprising an annular collar for maintaining the pusher rod in coaxial relationship with the bore, the pusher rod and collar having respectively a circum-

ferential recess and a radially extending aperture for accommodating a sphere capable of preventing their relative axial movement, while said sphere is so accommodated, the bore also having a recess located to communicate with the aperture in one position of the collar so that when the collar assumes said one position the recess partially accommodates the sphere so as to permit relative axial movement of the collar and pusher rod, the collar being maintained at said one position by the action of the sphere, and thereby provides support for the pusher rod.

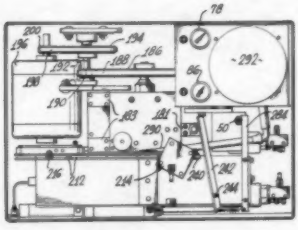
3. A bar stock feed arrangement comprising a housing having an axial bore, a pusher rod adapted to engage bar stock, an annular collar for maintaining the pusher rod in coaxial relationship with the bore and a drive means for moving the pusher rod along the bore arranged to act in one sense appropriate for advancing bar stock engaged by the pusher rod and in an opposite sense appropriate for returning the pusher rod to a location suitable for receiving a charge of bar stock; the pusher rod and collar having respectively a circumferential recess and a radially extending aperture for accommodating a sphere capable of preventing their relative axial movement while said sphere is so accommodated, the bore also having a recess with an inclined side wall permitting entry and exit of the sphere, located to communicate with the aperture in one position of the collar so that when the collar assumes said one position the recess partially accommodates the sphere so as to permit relative axial movement of the collar and pusher rod, the collar being maintained at said one position by the action of the sphere to thereby provide support for the pusher rod and being urged away from said one position by a projection on the pusher rod when the drive means acts in said opposite sense, the arrangement also including a plurality of support blocks capable of being maintained in a configuration appropriate for supporting bar stock protruding from said housing, a plurality of symmetrically disposed levers, pivotally mounted to the housing, and means for resiliently biassing each lever to urge the support blocks into their supportive configuration.

4,376,399

MICROCIRCUIT COVER REMOVER

James Victor, 1460 Uppingham Dr., Thousand Oaks, Calif. 91360

Filed Oct. 7, 1980, Ser. No. 194,766
Int. Cl.³ B26D 7/02
U.S. Cl. 83—13 **6 Claims**



1. Apparatus for removing a microcircuit package cover, said apparatus comprising:

a frame;

a work table mounted for sliding movement with respect to said frame;

a motor driven rotary cutter blade mounted on said frame in an operative relationship with said work table;

clamping means for releasably securing a microcircuit package on said worktable, including a clamping lever pivotally mounted on said table, and a clamping actuator coupled to said lever to raise and lower it with respect to said table, whereby the package is clamped to said table by downward urging of said clamping lever;

depth-of-cut control means, for varying the position of said cutter blade vertically with respect to said table;

width-of-cut control means, including a stop plate against which the package is secured, and means for varying the transverse spacing between said cutter blade and said stop plate;

table translating means, for moving the table through a cutting stroke and a return stroke parallel to the plane of said cutting blade; and

length of cut control means to vary the length of the cutting and return strokes to conform with the package size;

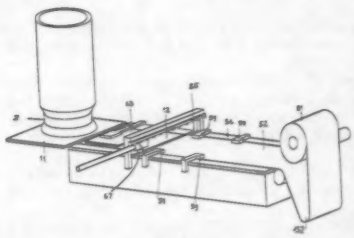
whereby the package lid can be removed by making four cutting strokes along the lid edges.

4,376,400

IMPROVEMENTS IN A MACHINE FOR APPLYING A GUSSET TO TUBULAR ARTICLES SUCH AS WOMEN'S PANTYHOSE

Vinicio Gazzarrini, Tavarnuzze, Italy, assignor to Solis s.r.l., Florence, Italy

Filed Jun. 23, 1980, Ser. No. 162,166
Claims priority, application Italy, Jun. 22, 1979, 9462 A/79
Int. Cl.³ B26D 5/20
U.S. Cl. 83—109 **9 Claims**



1. Device for the formation and feeding of a gusset from a continuous spool of fabric web, in a machine including a gusset carrying plate for applying a gusset to a tubular article such as a woman's pantyhose, comprising:

a web receiving means including a fixed work support having a horizontal plane for receiving the leading end of the fabric web taken from its spool, said fixed work support having a transverse groove therein;

means for intermittently unwinding the fabric web including an electric motor, and a photocell device operable to control said motor, to unwind the fabric web to form a loop of fabric in cascade;

disposed upstream of said plane, a web handling means including a carriage operable for alternate horizontal motion and carrying several web-pulling jaws projecting from said plane at the longitudinal edges of the web feed path and oscillating relative to the plane;

said web-pulling jaws pressing the upper side of the fabric web onto said horizontal plane of said fixed work support and moving the fabric web therealong;

a tampon pincer projecting from said plane, and operable for alternate horizontal motion and oscillating relative to the plane for transferring each gusset formed from the web onto the gusset-carrying plate of the machine;

a shear with circular blade and counter-blade movable transversely on said plane and with partial penetration into said transverse groove; and

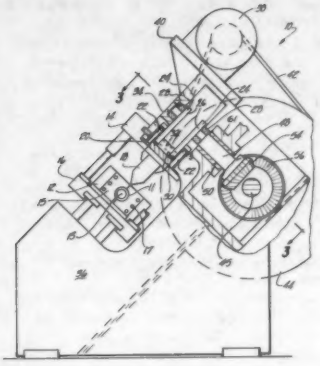
whereby during the cutting of the web for the formation of the gussets, it is pressed onto the plane by the jaws and tampon pincer.

4,376,401

BEVEL GEAR DRIVE WITH MEANS TO CONTROL BACKLASH FOR FLYING RAM CUTOFF MACHINE

John J. Borzym, 4820 Schoolbell, Birmingham, Mich. 48010

Filed Dec. 5, 1980, Ser. No. 213,295
Int. Cl.³ B23D 21/00, 25/04
U.S. Cl. 83—319 12 Claims



1. A cutoff machine for severing an elongated workpiece while the workpiece is moving in a path along its longitudinal axis, comprising:

a stationary frame including a bed extending beneath and generally parallel to said path, said frame further including a head portion above said path and spaced from said bed;

a ram above said bed and extending essentially parallel to said path;

linkage means connecting said ram with said head portion for swinging movement about axes extending transverse to said path;

drive means coupled with said ram for imparting swinging movement to said ram, said drive means including:

(1) a pair of input shafts rotatably mounted on said head portion and extending transversely to said path,

(2) means coupling said input shafts with said ram for translating rotational movement of each of said input shafts to motion,

(3) a drive shaft rotatably mounted on said head portion and extending in a direction generally parallel to said path and between said pair of input shafts, said drive shaft being adapted to be coupled with a source of power for rotating said drive shaft;

(4) first and second gear means located at spaced locations along said drive shaft for translating rotational motion of said drive shaft to said pair of input shafts;

a pair of spaced apart supports on said head portion, each of said supports having said drive shaft journalled for rotation thereof; and

spacer means extending between one of said first and second gear means and one of said supports for limiting the movement of said drive shaft along its longitudinal axis to a preselected magnitude thereof in order to control the amount of backlash in said drive means.

4,376,402

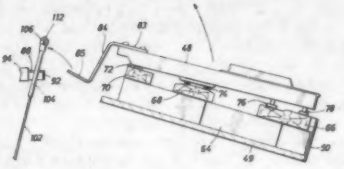
FOLDING PIANO

Charles T. Helpinstill, II, 5808 S. Rice Ave., Houston, Tex. 77081

Filed Jun. 18, 1980, Ser. No. 160,442
Int. Cl.³ G10C 3/12
U.S. Cl. 84—176 10 Claims

1. In a piano which includes a piano body having a frame work and strings therein, and designated action mechanisms having a plurality of pickup fingers associated therewith, each action mechanism causing a hammer to strike a designated string to form a musical note, and which piano further includes a separable keyboard assembly including a plurality of keys, the improvement which comprises:

(a) an elongate positioning rail for operatively aligning the pickup fingers and each action mechanism for engagement and disengagement relative to a designated key of the keyboard assembly, said positioning rail incorporating a plurality of slots for receiving the pickup fingers;



(b) means for selectively engaging and disengaging the plurality of keys with the action pickup fingers;

(c) means for fixedly attaching the keyboard assembly to the piano body at an operative position such that striking a designated key of the keyboard assembly causes a hammer to strike a designated string in the piano body to form a musical note; and

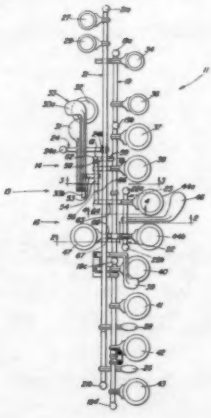
(d) means for selectively altering the position of the keyboard assembly relative to the piano body between operative and inoperative positions.

4,376,403

FLUTE

Walter Haedrich, 802 41st St., Moline, Ill. 61265, and J. Dennis Lawson, Davenport, Iowa, assignors to Walter Haedrich, Moline, Ill.

Filed May 1, 1981, Ser. No. 259,755
Int. Cl.³ G10D 9/04
U.S. Cl. 84—384 7 Claims



1. In a Boehm flute having a B flat key, Briccialdi B flat lever, G key and G sharp lever mounted on rod and sleeve assemblies, a facilitator mechanism for operating the B flat key comprising:

rocker arm means pivotally suspended between the Briccialdi B flat lever and the rod and sleeve assemblies bearing the B flat key and coupled between the B flat key and the G key;

foot means fixed to, extending from, and movable by operation of, the Briccialdi B flat lever to engage and tilt said rocker

arm means in a first direction for moving the B flat key from open to closed position; and

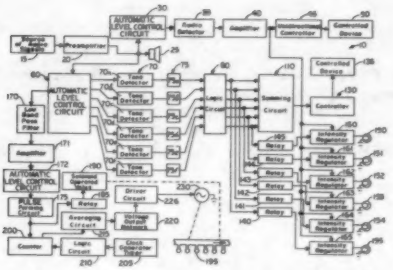
said rocker arm means being movable by operation of the G key to tilt in a second direction for moving the B flat key from closed to open position if the Briccialdi B flat lever is being operated.

4,376,404

APPARATUS FOR TRANSLATING SOUND INTO A VISUAL DISPLAY

Albert G. Haddad, Chapel Hill, N.C., assignor to Agricultural Aviation Engineering Co., Las Vegas, Nev.

Filed Oct. 23, 1980, Ser. No. 200,004
Int. Cl.³ A63J *17/00*; F21P *7/00*
U.S. Cl. 84—464 R **32 Claims**



1. Apparatus for translating sound into a visual display, said sound comprising a band of frequencies over which appear the rhythmic tones, said apparatus comprising:

(a) means for producing audio signals;

(b) filter means responsive to said audio signals for advancing signals of the frequencies of the band over which appear the rhythmic tones;

(c) pulse forming means connected to said filter means and responsive to said signals of the frequencies of the band over which appear the rhythmic tones for producing pulse signals representative of the beat of the rhythmic tones;

(d) visual means; and

(e) circuit means responsive to said pulse signals representative of the beat of the rhythmic tones and counting said pulse signals within timing periods, the respective counts of the number of pulse signals counted within the respective timing periods producing output voltage levels which are proportional to the beat of the rhythmic tones for varying said visual means in rhythm with said rhythmic tones.

4,376,405

AUTOMATIC HARD-SOFT ROCKET DETENT SYSTEM

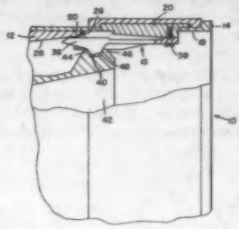
Jimmy M. Madderra, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1981, Ser. No. 240,701
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.806 **3 Claims**

1. A hard-soft detent assembly for engagement with a detent groove on a missile for releasably securing said missile in a telescoping launcher/carrier having inner and outer launch tubes comprising:

a. a housing secured to the inner surface of said outer launch tube; and,

b. engaging means carried in said housing and disposed for releasably engaging said detent groove when said launcher/carrier is in collapsed position whereby said missile is rigidly secured in said launcher/carrier, said engaging means disposed for release of said missile responsive to forward motion of said missile subsequent to ignition



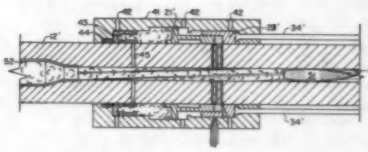
thereof and extension of said launcher to extended position.

4,376,406

HYBRID GUN SYSTEM

William L. Black, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1981, Ser. No. 239,288
Int. Cl.³ F41F *1/04*
U.S. Cl. 89—7 **6 Claims**



1. A gun for utilizing liquid propellant to increase velocity of a projectile fired with a solid propellant charge comprising:

a barrel having a breech end and a muzzle end and a bore extending therethrough:

a chamber in said breech end configured to receive a cartridge therein;

port means extending through said barrel intermediate said chamber and said muzzle end for passing gas therethrough;

manifold means comprised of a plurality of sections concentrically surrounding said barrel and said plurality of sections spaced therefrom different distances for providing a liquid reservoir and positioned to enclose the port means therein;

differentially shaped piston means to cooperate with said differentially spaced manifold sections fittingly sealing said liquid reservoir and configured to transmit gas pressure from said port means to said liquid reservoir;

conduit means located in said barrel between said port means and said muzzle end and communicating with said liquid reservoir for passage of liquid therethrough, whereby movement of said piston under influence of said propellant gas pressure causes liquid injection within said bore, and

a check valve concentrically held about said barrel within said manifold to selectively close said conduit means.

4,376,407

DEVICE FOR BREECH RING

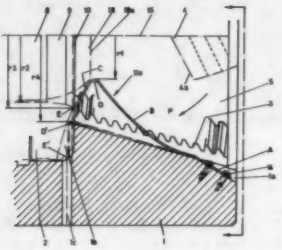
Sten Hallqvist, and Erik Eriksson, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 18, 1980, Ser. No. 217,596
Claims priority, application Sweden, Dec. 18, 1979, 7910443
Int. Cl.³ F41F *11/07*
U.S. Cl. 89—20 R **9 Claims**

1. In a firearm having a threaded breech ring closed by a

threaded screw mechanism, said firearm receiving a shell component and a charge from a ramming operation, said charge being retained in place by a stripper extending through a slot in said screw mechanism during a ram removing operation, an apparatus for improving the stripper action comprising:

a plurality of plate springs, each connected at one end in a recess of said breech ring and extending into said breech ring through a plurality of sectors on said breech ring and screw mechanism which are without threads, said plate



springs extending towards the bore axis of said firearm along a first portion, then away from said bore axis at an angle to said first portion along a second portion when said screw mechanism is not engaged in said breech ring; and

said plate springs second portion retaining with said stripper said charge at a predetermined location during said ram removing operation, and said plate springs being pressed against said breech ring along its first portion upon closure of said breech mechanism and said second portion extends into a space of said breech ring.

4,376,408

AIR CIRCULATION SYSTEM IN A VEHICLE COMPARTMENT OF AN AUTOMOTIVE VEHICLE

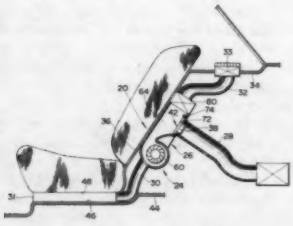
Tetsuya Iijima, Tokyo, and Hiroshi Yano, Higashiyamato, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Nov. 20, 1980, Ser. No. 208,682

Claims priority, application Japan, Nov. 21, 1979, 54-160351[U]

Int. Cl.³ B60H *3/06*

U.S. Cl. 98—2.03 **6 Claims**



2. An air circulation system for circulating air in a vehicle compartment comprising:

an air intake defined below a vehicle seat;

an air outlet located at a rear portion of a vehicle rear seat and directed upwardly to discharge the air introduced through said air intake for recirculation within the vehicle compartment;

air passage means interpositioned between said air intake and said outlet and including an air circulating means for generating a flow of air within said air passage means and forcing the air to flow therethrough;

a ventilation passage joined with said air passage means downstream of said air circulating means which passage is adapted to ventilate the air to the outside of the vehicle compartment; and

damper means provided upstream of said outlet and being movable between a first position where said air passage means is connected to said outlet and a second position where said air passage means is connected to said ventilation passage said damper means thereby switching, recirculating and ventilating air in the vehicle compartment.

4,376,409

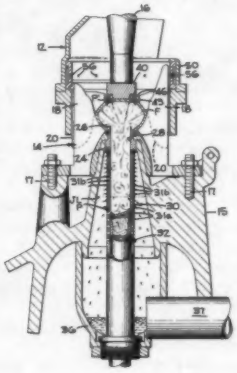
CITRUS FRUIT JUICE EXTRACTOR

Wilber C. Belk, Lakeland, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 11, 1980, Ser. No. 177,029

Int. Cl.³ A23N *1/02*; B30B *9/02*

U.S. Cl. 99—509 **1 Claim**



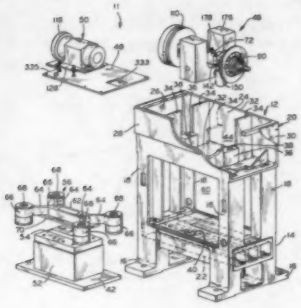
1. A juice extractor of the type that concurrently compresses a whole citrus fruit between opposed cups having interdigitating fingers, directs juice and juice sacs to an elongate strainer tube having means for cutting a plug from the peel and discharges, while the fruit is being compressed, the juice and juice sacs through apertures in the strainer tube to a collection reservoir by a closely fitted orifice tube moveable toward and away from the cups in said strainer tube,

the improvement comprising means in said extractor to effect passage of whole juice sacs through a portion of the apertures in said strainer tube, said means comprises providing one portion of the strainer tube with apertures of a size to allow free passage of whole juice sacs and the remaining, portion with apertures of a size which will cause rupturing of the juice sacs, said orifice tube while moving toward the cups first traverses said one portion of the strainer tube and effects passage of whole juice sacs to the reservoir and thereafter traverses the other portion of the strainer tube to discharge juice and ruptured membranes through the apertures in said remaining portion, said plunger in moving toward the cups progressively compresses the extracted material contained in the strainer tube such that the rate at which the compression increases in said one portion is substantially less than said remaining portion.

4,376,410
PRESS GUIDE STRUCTURE

Terry L. Wissman, New Bremen, and Daniel A. Schoch, Minster, both of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Sep. 8, 1981, Ser. No. 299,827
Int. Cl.³ B30B *13/00, 15/04*
U.S. Cl. 100—214 17 Claims

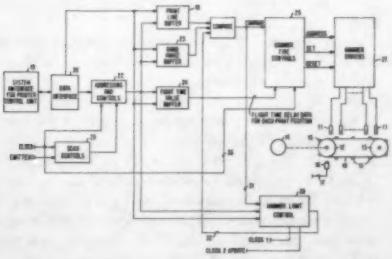


1. A mechanical press comprising: a bed, a crown, a frame interconnecting the bed and crown, crankshaft means rotatably mounted in the crown, at least one connection arm connected to an eccentric portion of said crankshaft means and driven by said crankshaft means in rotary-oscillatory motion in a vertical plane, a plurality of parallel guideposts rigidly connected to and depending from said crown, said guideposts being held in parallelism solely by their connection to said crown, a slide assembly reciprocably mounted on said guideposts and accurately guided thereby for rectilinear motion in said vertical plane, said connection arm being rotatably connected to said slide assembly by a pivotal connection means for converting the rotary-oscillatory motion of said connection arm into the rectilinear motion of said slide assembly, and bearing means on said crown engaging said slide assembly at least two bearing points in said vertical plane on directly opposite sides of said slide assembly, said bearing points lying along a line intersecting the axis of rotation of said pivot connection means as said slide assembly reciprocates, whereby tilting of said slide in the direction of said vertical plane is resisted.

4,376,411
PRINT HAMMER LIMIT CONTROL

James E. Carrington, Vestal, and Gerald R. Westcott, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,287
Int. Cl.³ B41J *1/20*
U.S. Cl. 101—93.14 14 Claims



1. A printer control system for use in a line printer wherein said line printer comprises a row of print hammers electrically operable for recording data at a plurality of print positions of a print line, a moving type carrier for cyclically presenting type characters at each print position of said print line in sequential print intervals of a print line cycle, and print control means for providing selection signals to hammer operating circuitry for controlling the turn on of said print hammers to effect printing operations in accordance with stored print data and type position data presented during said sequential print intervals in synchronism with the movement of said type characters, said print control means including a hammer limit control comprising

first means operative in response to said selection signals provided by said control means for indicating the number of hammers being selected to be turned on in a given control interval whose duration is a function of said print intervals,

second means for indicating the number of print hammers selected to be turned on in a plurality of said control intervals preceding said given control interval,

said plurality of control intervals having a duration which is a function of the turn on time of said print hammers,

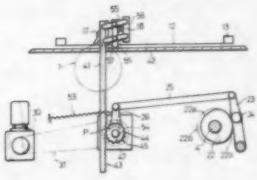
means responsive to the combined number of hammers indicated by said first and second means for predicting at any instant of said control interval the total number of print hammers to be turned on, and

means responsive to said predicting means for preventing the selection of said print hammers for turning on when said predicted total number of hammers equals a predetermined maximum number.

4,376,412
SQUEEGEE PRESSING DEVICE IN A SCREEN PRINTING MACHINE

Kazuo Nagatani, Seki, Japan, assignor to Sakurai Machine Trading Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1981, Ser. No. 329,173
Claims priority, application Japan, Jun. 4, 1981, 56-086057
Int. Cl.³ B41L *27/36, 13/02*
U.S. Cl. 101—124 6 Claims



1. In a screen printing machine of the type in which a screen plate is reciprocated to and fro and printing paper sheets are supplied to the lower surface zone of the screen plate in timing with forward travel of the screen plate and in which the screen plate is pressed by the squeegee for printing the paper sheets through the screen when the squeegee vertically movable within predetermined stroke distance is at the lowermost stroke position thereof, a device for pressing the squeegee for printing, comprising

a support shaft rotatable in either directions,

a first intersecting axis gear mounted on said support shaft and rotatable in either direction independently of the rotation of the support shaft and in timing with displacement brought about by a cam,

a rotatable member rotatably carrying at least one second intersecting axis gear meshing with said first intersecting axis gear, said rotatable member being carried for rotation about said support shaft and independently of said support shaft,

a third intersecting axis gear mounted on said support shaft

for rotation in unison therewith and meshing with said second intersecting axis gears,

a pair of pinions mounted on said support shaft for rotation in unison therewith,

at least one squeegee post meshing with said pinions and vertically movable by being linked with forward and reverse rotation of the support shaft, said post carrying said squeegee at the upper end extremity thereof, and

drive means for driving said rotatable member,

said squeegee post being afforded a predetermined downward displacement through the medium of all of said intersecting axis gears and said support shaft by differential displacement brought about by said cam, for pressing said squeegee to said screen plate, said squeegee post being raised a larger distance by said drive means through the medium of said second and third intersecting axis gears and said support shaft when said first intersecting axis gear remains stationary, for lifting the squeegee above the screen plate.

4,376,413

APPARATUS FOR CONTROLLING TIMINGS OF THROWING ON OR OFF CYLINDERS OF PRINTING PRESS

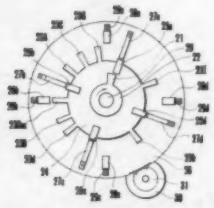
Tamio Kuroda, Soka, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,431

Claims priority, application Japan, Dec. 5, 1980, 55/175329[U]

Int. Cl.³ B41F *5/06, 7/04*

U.S. Cl. 101—182 **3 Claims**



1. Apparatus for controlling timings of throwing on and off cylinders of a printing press comprising:

a first detection member mounted on a driving shaft of a n times cylinder, where n is an integer larger than 2;

n first detection means for producing selection signals when said first detection member passes by, said first detection means being spaced circumferentially by an equal angle;

a plurality of second detection members mounted on said driving shaft at predetermined angular positions;

n second detection means for producing timing signals when said second detection members pass by, said second detection means being spaced circumferentially by an equal angle;

means for selecting either one of said second detection means according to said selection signal; and

means responsive to a timing signal produced by said selected second detection means for throwing on or off cylinders of said printing press.

4,376,414

PRINTING PLATE ATTACHMENT ARRANGEMENT

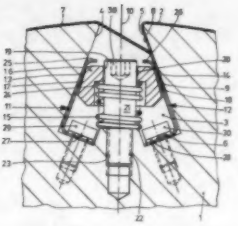
Rainer Burger, Augsburg, and Werner Kleininger, Neusäss, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed May 5, 1981, Ser. No. 260,686

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018249

Int. Cl.³ B41F *27/12*

U.S. Cl. 101—415.1 **11 Claims**



1. Printing plate attachment arrangement to secure a flexible printing plate (2) to the surface of a printing cylinder (1) of a rotary printing machine,

said printing cylinder (1) being formed with a groove (3) extending parallel to the axis of rotation of the cylinder and having resilient means (11, 12) to press end portions (8, 9) of the printing plate (2) against the walls of the groove,

wherein the groove (3) is defined by two inclined walls (4, 5) which converge towards the open side of the groove and which are positioned in mirror-image relation with respect to a radially extending center plane (10) passing through a median point of the groove, said inclined walls defining angles of inclination with respect to a tangent of the cylinder of the junction of the groove and the outer surface (7) of the cylinder, said angles being acute angles;

the resilient means comprises leaf spring means (11, 12; 11', 11'', 12') having two clamping portions (13, 14) shaped and positioned to fit against opposite walls (4, 5) of the groove;

a clamping wedge body (16) is provided having outwardly shaped surfaces (17, 18) fitting against said clamping portions (13, 14) of the leaf spring means;

means (21) are provided for guiding said clamping wedge body (16) for radial movement in said center plane (10) within the groove;

and spring means (15) are positioned to engage said clamping wedge body and biasing said clamping wedge body (16) in radially outward direction,

whereby the clamping portions of the leaf spring means will be outwardly deflected and pressed against the converging side walls of the groove.

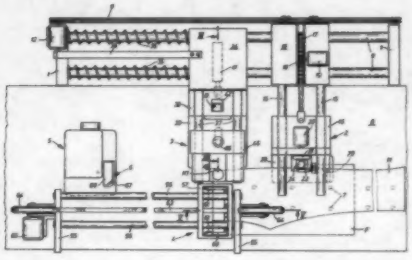
and wherein the end portions (8, 9) of the printing plate cylinder are wedged between one leaf spring clamping portion (14) and the adjacent wall (5) of the groove by clamping engagement of the leaf spring portion with the adjacent wedge surface (18) of the clamping wedge body (16), the other side (17) of the clamping wedge body bearing against the other leaf spring clamping portion (11) and being supported by engagement of said clamping portion against the adjacent wall (4) of the groove (3).

4,376,415

DEVICE FOR SEWING WORKPIECE PLIES TOGETHER IN CONTOUR ALIGNMENT

Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 259,143
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016676
Int. Cl.³ D05B 19/00, 21/00
U.S. Cl. 112—121.11 10 Claims



1. A device for sewing upper and lower workpiece plies together adjacent contoured substantially aligned edges thereof in a sewing machine having automatic workpiece guide means for sewing along a contour as the plies are fed in a sewing direction, the lower workpiece ply initially extending beyond the contoured edge of the upper workpiece ply, comprising:

a cutting mechanism positioned upstream of the sewing machine workpiece guide means in the sewing direction, having a movable cutting tool for cutting a portion of the lower workpiece ply extending beyond the contoured edge of the upper workpiece ply, said cutting mechanism including means for sensing the contoured edge of the upper ply and means for moving the cutting tool in response to said sensing means to follow the contoured edge of the upper ply; and

a feed mechanism positioned between said cutting mechanism and the sewing machine workpiece guide for moving the workpiece plies together into the sewing machine workpiece guide means.

4,376,416

CONVERTIBLE SAILBOAT/MOTORBOAT

George P. Carver, 1032 Santiago Dr., Newport Beach, Calif. 92660

Filed Feb. 19, 1980, Ser. No. 122,275
Int. Cl.³ B63B 35/00; B63H 9/04
U.S. Cl. 114—39 1 Claim

1. A monohull boat for operation as a displacement boat and convertible to operation as a planing boat including sails, a mainsail boom, an engine, a keel with a pivot for rotation from a downward-forward position to an upward-rearward position, the improvement comprising:

an adjustable boat hull keel separate and independent from the mainsail boom,

the keel having a length between 10% and 30% of the boat waterline length,

a ratio of keel weight to total boat weight between 0.2 and 0.4 and a boat displacement/length ratio less than 140,

the keel having an aspect ratio between 5 and 10,

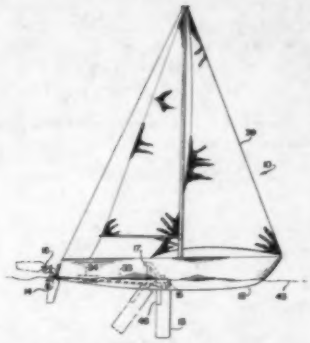
the keel pivot being located to the rear of the position of the major axis of the fully downwardly-located keel a distance which is more than 30% of the length of the keel and above the keel-hull intersection line a vertical distance which is more than 30% of the length of the keel,

a means for moving the keel about the pivot to various positions and in the extreme far enough for the keel to be rearwardly located essentially inside the hull,

the elevated and rearwardly placed pivot in combination with the high keel aspect ratio of 5 to 10 and the ratio of keel weight to total boat weight affecting with full keel pivoting rearward a rearward movement of the total boat center-of-gravity 10% to 20% of the hull water line length while the center-of-gravity of the keel is moved rearward 20% to 45% of the water line length of the boat,

the fully rearwardly pivoted keel swinging essentially inside the hull providing essentially zero keel drag force against the speed of the boat in the water,

the keel including a trim tab portion comprising a trim tab



being located in the upper 20% to 40% of the keel length, the trim tab being adjusted separately and independently with respect to the mainsail boom, to balance the lateral force against the sailboat created by the sails' reaction to the wind, the location of the trim tab in the upper keel portion in combination with the keel aspect ratio greater than 5 providing keel functioning with minimized boat keeling moment and maximized hydrodynamic efficiency,

the fully-rearwardly keel position in combination with adequate engine horsepower and thrust providing the hull to achieve power planing speed,

the adequate thrust in combination with the keel position adjustment, the keel pivot position and the keel high aspect ratio providing a convertible boat.

4,376,417

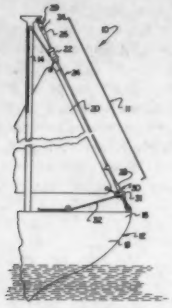
FORESTAY CONNECTOR

Paul Blonski, Brecksville, Ohio, assignor to Hyde Products, Inc., Westlake, Ohio

Division of Ser. No. 13,248, Feb. 21, 1979, Pat. No. 4,254,543.
This application Mar. 2, 1981, Ser. No. 239,546
Int. Cl.³ B63H 9/04
U.S. Cl. 114—106 8 Claims

1. A stay unit for coupling into a stay assembly of a sailboat, said unit comprising an axially extending stay rod member for supporting a mast of the sailboat, a deformed sleeve member circumscribing one end portion of said rod member and having a load-bearing surface against which an axial load may be applied, one of said sleeve and rod members having different inside dimensions defining recessed and ridge portions and said rod and sleeve members being interlocked by cold formed metal of the other of said rod and sleeve members between and in said ridge and recessed portions, and a collar fitting for use in coupling the unit into a stay assembly, said collar extending

outwardly of said end portion and disposed about said rod and sleeve member and having an abutment engaging said load-



bearing surface to prevent movement of said collar off said rod over said sleeve member.

4,376,418

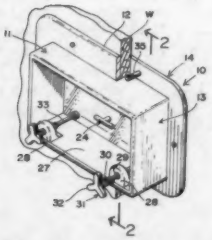
PORTLIGHT FOR MARINE USE

John M. Childs, 13031 Deva St., Coral Gables, Fla. 33156

Filed Oct. 30, 1980, Ser. No. 202,272

Int. Cl.³ B63B *19/00*

U.S. Cl. 114—178 **11 Claims**



1. In a portlight for installation through a side wall opening of a marine vessel from the outside, the improvement comprising, a rectangular frame member, said frame member being integrally formed with a tubular spigot portion defining a rectangular through opening and a flange extending perpendicularly-outwardly of one end of said spigot portion, and inwardly-extending peripheral lip at said one end of said spigot portion, said lip defining an interior, perpendicularly, peripheral shoulder at the inside of said one end of said spigot portion, a rectangular light of substantially same size and shape as said rectangular through opening in said tubular spigot portion, means for securing an upper end portion of said rectangular light against an inside upper wall portion of said spigot portion for holding the upper end of said light against said shoulder, and clamp means for removably securing the lower end portion of said light against said shoulder, whereby, upon installation of the portlight, the pressure of water impinging against the outside of the light fitted in the frame will be transferred through the frame to the outside of the vessel hull.

4,376,419

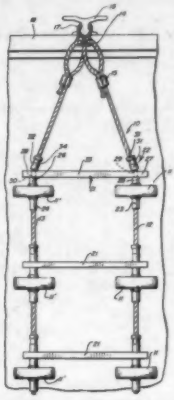
MARINE FENDER

Jens A. Hellskov, Madison, Wis., assignor to Sidewinder International, Ltd., Wilmington, N.C.

Filed Jul. 8, 1981, Ser. No. 281,556

Int. Cl.³ B63B *59/02*

U.S. Cl. 114—219 **14 Claims**



1. A marine fender structure comprising:

a plurality of rollers each defining a hub portion and a peripheral portion;

first and second flexible, elongated support elements;

means for positioning said support elements in spaced, parallel relationship defined by a plurality of spacer elements, each having a midportion and opposite ends, each end being provided with a through opening;

retaining means for retaining said rollers and spacer elements in association with said support elements in groups of a pair of said rollers and one of said spacer elements, said retaining means including a first sleeve secured to one of said support elements, a second sleeve secured to the other of said support elements, a first of said rollers being rotatively mounted to said one support element closely above said first sleeve, a second of said rollers being rotatively mounted to said other support element closely above said second sleeve, a first tubular spacer mounted loosely about said first support element closely above said first roller, a second tubular spacer mounted loosely about said second support element closely above said second roller, a spacer element being positioned with said first support element extending through the through opening in one of said spacer element ends and the second support element extending through the through opening in the other of said spacer element ends, said spacer element ends being disposed closely above said first and second tubular spacers respectively, a third tubular spacer mounted loosely about said first support element closely above said one end of the spacer element, a fourth tubular spacer mounted loosely about said second support element closely above said other end of the spacer element, a third sleeve secured to said first support element closely above said third tubular spacer, and a fourth sleeve secured to said second support element closely above said fourth tubular spacer, said rollers being disposed in horizontally spaced relationship with the support elements extending vertically in horizontally spaced relationship; and

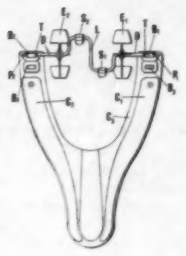
means at one end of said spaced support elements for securing them jointly to a suitable support on a marine craft with the support elements hanging vertically downwardly adjacent a side of the craft with said rollers acting as rotatable fenders and said midportion of the spacer elements acting as ladder rungs.

4,376,420

INFLATABLE BOAT INCLUDING A MECHANICAL PROPULSION ASSEMBLY FOR OPERATION BY A USER

Bruno Fracarossi, Via Luigi Einaudi 91, Conegliano (Treviso), Italy

Continuation-in-part of Ser. No. 960,179, Nov. 13, 1978, abandoned. This application Mar. 11, 1981, Ser. No. 242,624
Int. Cl.³ B63B 7/08
U.S. Cl. 114—345 10 Claims



1. An inflatable boat comprising:
a unitary inflatable structure including a base air chamber and first and second branch air chambers;
said inflatable base air chamber having a central member and first and second branches forming a fork shape;
said first inflatable branch air chamber being overlaid at least on said first branch;
said second inflatable branch air chamber being overlaid at least on said second branch;
said inflatable base air chamber, and first and second inflatable branch air chambers being flexible, independently inflatable, and being effective when inflated to impart said fork shape and a semi rigidity to said boat and being deflatable to permit folding of the inflatable air chambers into a substantially reduced space;
first and second mutually aligned bushes integrally disposed at corresponding first positions on said first and second branches, respectively;
third and fourth mutually aligned bushes integrally disposed at corresponding second positions on said first and second branches, respectively;
a throw-type shaft selectively fittable into said first and second bushes or into said third and forth bushes spanning ends of said fork shape and having a length exceeding a distance between outsides of said first and second bushes and said third and fourth bushes whereby ends of said throw-type shaft project beyond said bushes;
removable means in said ends for blocking removal of said ends from said first and second bushes or said third and fourth bushes;
at least one paddle wheel on said throw-type shaft within said fork shape;
means for keying said at least one paddle wheel to said throw-type shaft;
a spacing between said first and second branches being effective to permit legs of a user whose torso is supported on said central member to project downward therethrough while feet of the user rotate said throw-type shaft; and said first and second positions being at different longitudinal distances from said central member whereby different leg lengths of the user are accommodated.

4,376,421

DOWNED AIRCRAFT POSITION INDICATOR

Glenn R. Skinner, 621 S. Mayo Dr., Tarpon Springs, Fla. 33589

Filed Apr. 9, 1980, Ser. No. 138,543
Int. Cl.³ G08B 5/00, 5/40
U.S. Cl. 116—211 7 Claims

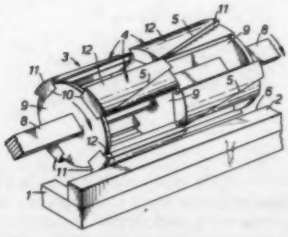
1. An apparatus for indicating the position of a downed aircraft, comprising,
a sealed storage tank means fixedly secured to said aircraft and disposed internally thereof, within the fuselage portion of said aircraft, so that said storage tank offers no wind resistance to the forward progress of said aircraft when in flight,
said storage tank containing a preselected substance of the type readily visible when the substance is spread upon the earth or foilage, and
means for expelling said substance from said tank while said tank remains fixed to said aircraft to facilitate rescue of personnel.

4,376,422

ANIMAL BEDDING MATERIAL

Gareth D. J. Whitehead, Gaveston, 131 Cowick La., and Thomas H. Gardner, 8 Haven Rd., both of Exeter, Devon, England

Continuation-in-part of Ser. No. 205,502, Nov. 10, 1980, abandoned. This application Jan. 28, 1981, Ser. No. 229,143
Claims priority, application United Kingdom, Nov. 10, 1979, 7938990; Nov. 13, 1979, 7939275
Int. Cl.³ A01K 1/015
U.S. Cl. 119—1 7 Claims



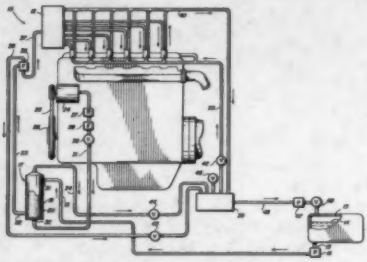
1. A bedding material for animals adapted for direct contact by the animals, comprising a mixture of at least two different sizes of newsprint shreds, said shreds each having a width of from about 10 to about 40 mm and a length of from about 5 to about 120 mm, whereby said mixture includes a sufficient proportion of sufficiently small shreds such that the mixture is substantially uncongealed following a prolonged period of use.

4,376,423

METHOD AND APPARATUS FOR SATURATING A LIQUID FUEL WITH A GAS AND AN INTERNAL COMBUSTION ENGINE

Paul E. Knapstein, Lake Wales, Fla., assignor to William C. Knapstein and Carol A. Knapstein, both of Vero Beach, Fla.

Filed Jun. 8, 1981, Ser. No. 271,363
Int. Cl.³ F02M 43/00
U.S. Cl. 123—1 A 25 Claims



1. An internal combustion engine having a gas saturator for saturating liquid fuel with a gas, comprising in combination:

an internal combustion engine;

a gas saturation means for saturating gas into a liquid fuel and having a liquid fuel inlet and a liquid fuel outlet and a gas inlet;

gas compressor means for compressing a gas, said gas compressor means being connected to said gas saturation means gas inlet for directing gas under pressure into said gas saturation means; and

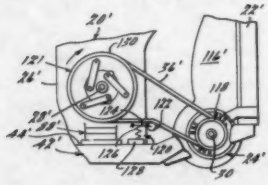
means for directing a liquid fuel saturated with gas from said gas saturation means into said internal combustion engine combustion chambers whereby a liquid fuel saturated with a gas is burned in an internal combustion engine.

4,376,424

CENTRIFUGAL FAN CONTROL

Joseph S. Mazur, Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 2, 1980, Ser. No. 183,508
Int. Cl.³ F01P 3/18
U.S. Cl. 123—41.12 11 Claims



1. In a vehicle of the type including a liquid cooled, forwardly mounted engine having a crankshaft mounted therein for rotation about an axis transverse to the longitudinal axis of the vehicle; a radiator in heat exchange with ambient air, said radiator spaced forwardly of the engine with respect to the longitudinal axis and having a width generally parallel to the crankshaft axis with the discharge side of the radiator facing the engine; a fan positioned to receive air from the discharge side of the radiator and having an input shaft defining an axis about which the fan rotates; the improvement comprising:

means mounting the cooling fan for rotation about the fan axis and positioning the fan axis substantially parallel to the crankshaft axis and behind the plane of the radiator with respect to the longitudinal axis;

a cross-flow fan defining the cooling fan;

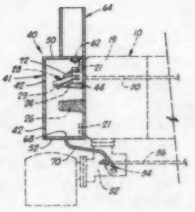
a belt drive assembly for drivingly connecting the crankshaft with the input shaft; and means drivingly interposed between the crankshaft and the fan for varying the rotational speed of the fan with respect to the rotational speed of the crankshaft in response to the cooling requirements of the engine.

4,376,425

LUBRICATING APPARATUS FOR PUMPING UNIT ENGINES

Steven M. Cantrell, Ada, Okla., assignor to Oklahoma Basic Economy Corporation, Ada, Okla.

Filed May 18, 1981, Ser. No. 264,292
Int. Cl.³ F01M 9/10, 1/00
U.S. Cl. 123—90.38 3 Claims



1. Apparatus for continuously lubricating a pumping unit engine having exposed intake and exhaust valve means, rocker arm means and carburetor throttle mechanism positioned at one end thereof comprising:

a housing including a top and bottom adapted to be attached to said engine over said intake and exhaust valve means and over said rocker arm means for preventing dust and other foreign matter from depositing thereon, said housing including at least one lubricant flow passageway disposed in the top thereof positioned over said intake and exhaust valve means and said rocker arm means of said engine when said housing is attached to said engine whereby lubricant flowing through said lubricant flow passageway flows by gravity onto said valve and rocker arm means thereby lubricating such means;

an orifice for restricting the flow of lubricant flowing through said lubricant flow passageway attached to said housing over said passageway;

a lubricant reservoir having a lubricant flow passageway disposed therein sealingly connected to said lubricant flow passageway in said housing whereby lubricant contained in said reservoir flows by gravity through said lubricant flow passageways in said reservoir and in said housing, through said orifice and onto said valve and rocker arms means of said engine;

a second lubricant flow passageway disposed in the bottom of said housing for withdrawing excess lubricant therefrom by gravity; and

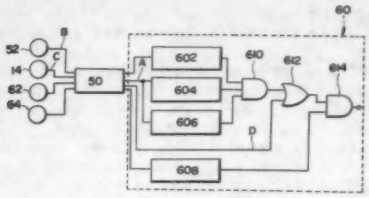
a conduit sealingly attached to said second lubricant flow passageway for conducting lubricant withdrawn from said housing by gravity to said carburetor throttle mechanism whereby said mechanism is also lubricated.

4,376,426

SPLIT TYPE INTERNAL COMBUSTION ENGINE

Haruhiko Iizuka, Yokosuka, and Fukashi Sugasawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 15, 1980, Ser. No. 216,181
Claims priority, application Japan, Dec. 20, 1979, 54-166158
Int. Cl.³ F02D 17/00
U.S. Cl. 123—198 F 7 Claims



1. An internal combustion engine comprising:

(a) first and second cylinder units each including at least one cylinder;

(b) an induction passage provided therein with a throttle valve and divided downstream of said throttle valve into a first intake passage leading to said first cylinder unit and into a second intake passage leading to said second cylinder unit;

(c) a vacuum tank held at a vacuum above that in said induction passage downstream of said throttle valve;

(d) a stop valve provided at the entrace of said second intake passage and adapted to move toward its closed position when connected to said vacuum tank;

(e) a control circuit adapted to normally place said engine in a full engine mode of operation, said control circuit adapted to block the supply of fuel to said second cylinder unit and connect said vacuum tank to said stop valve thereby shifting the engine operation into a split engine mode when the engine load is below a predetermined value; and

(f) said control circuit including means for forcing the engine operation into its full cylinder mode regardless of engine load conditions before the vacuum in said vacuum tank reaches a value sufficient to move said stop valve to its fully closed position.

4,376,427

ENGINE AIR/FUEL RATIO CONTROL SYSTEM WITH BOTH NORMAL IDLING AND IDLE UP IDLING CAPABILITY

Kisaburo Mizuno, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 13, 1981, Ser. No. 321,191
Claims priority, application Japan, Nov. 20, 1980, 55-164277
Int. Cl.³ F02D 33/00
U.S. Cl. 123—339 13 Claims

1. For an internal combustion engine comprising an exhaust system and a fuel intake passage system comprising a carburetor which comprises an intake throat, a throttle valve mounted in said intake throat, and an idle up device which selectively acts on said throttle valve so as to control its most closed position to be either a first idling position near its fully closed position or a second idle up idling position slightly more open that said first idling position; said carburetor in its basic operational mode tending to deliver an air/fuel mixture richer than stoichiometric:

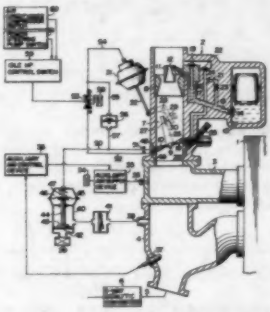
an air/fuel ratio control system, comprising:

(a) an oxygen sensor for detecting the concentration of oxygen in the exhaust gases in said exhaust system;

(b) a means for adjusting the air/fuel ratio of the air/fuel mixture being supplied to the engine through said fuel intake passage system towards the leaner, which receives the signal from said oxygen sensor, and which functions only when said sensor is detecting no oxygen in the exhaust gases in said exhaust system;

(c) a means for supplying a flow of secondary air into said exhaust system during idling engine operation, upstream of said oxygen sensor, in a flow amount sufficient to render the exhaust gases in said exhaust system leaner than stoichiometric, said means thus supplying secondary air when and only when it receives supply of a controlling vacuum;

(d) a first vacuum takeout port formed at a point in said intake throat which is downstream of said throttle valve when said throttle valve is in said first idling position but which is upstream of said throttle valve when said throttle valve is opened a slight amount from said first idling position;



(e) a second vacuum takeout port formed at a point in said intake throat which is downstream of said throttle valve when said throttle valve is in said second idle up idling position but which is upstream of said throttle valve when said throttle valve is opened a slight amount from said second idle up idling position; and

(f) a vacuum switching system, which provides supply of vacuum from said first vacuum take out port to said means for supplying secondary air as said controlling vacuum when said idle up device is controlling the most closed position of said throttle valve to be said first idling position, and which provides supply of vacuum from said second vacuum take out port to said means for supplying secondary air as said controlling vacuum when said idle up device is controlling the most closed position of said throttle valve to be said second idle up idling position.

4,376,428

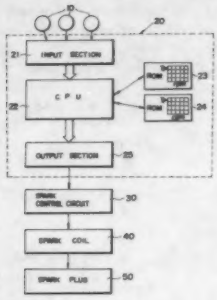
SPARK TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshitaka Hata, Fujisawa, and Giichi Shioyama, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 22, 1980, Ser. No. 123,568
Claims priority, application Japan, Feb. 23, 1979, 54-19842
Int. Cl.³ F02P 5/04
U.S. Cl. 123—417 14 Claims

1. Apparatus for controlling the occurrence times of discharges of a multi-cylinder internal combustion engine of an automotive vehicle having a transmission and sources for deriving signals indicative of: (a) the engine being cranked or operating normally, (b) the transmission being in high or low gear, (c) engine speed, and (d) the values of parameters determining engine load, said apparatus comprising a computer responsive to the signals, said computer including: read only memory means having tables for storing signals with values indicative of spark advance and dwell angle as functions of engine load and engine speed for the engine being cranked,

operating normally, the transmission being in high and low gear; said computer being responsive to the signals of the sources for selecting from the tables stored signals having values indicative of spark advance and dwell angle corresponding with the conditions indicated by signals (a), (b), (c) and (d); and a spark control circuit responsive to the signals having values indicative of spark advance and dwell angle for controlling the occurrence times of sparking of a spark plug for each cylinder of the engine.

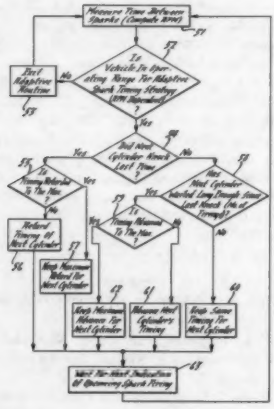


4,376,429

ADAPTIVE CYLINDER BY CYLINDER KNOCK RETARD CONTROL

Ralph A. Youngblood, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 23, 1981, Ser. No. 276,605
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 **1 Claim**



1. A method for timing the ignition spark events of a spark ignited internal combustion engine in a manner to adaptively improve engine performance cylinder by cylinder comprising the steps of:

detecting the crankshaft rotational position to determine the base timing for successive firings of each engine cylinder;

adjusting the spark timing of each engine cylinder individually to improve cylinder performance sequentially, one cylinder at a time;

detecting knocking of each of the individual engine cylinders;

storing information describing the knock history of each individual cylinder in an electronic engine control assembly for modifying the timing of a spark applied to each engine cylinder in response to detection of knock associated with that cylinder;

said step of adjusting the spark timing for each cylinder including determining if the vehicle engine cranksahft revolution rate (RPM) is within a predetermined range;

determining if the engine cylinder next to fire knocked the last time it was fired and,

determining the spark timing of the next to fire cylinder the last time it was fired;

determining whether the spark timing is retarded to the maximum if the next to fire cylinder did knock the last time;

retarding the timing of the next to fire cylinder if it is not retarded to the maximum and did knock last time and if the timing is retarded to the maximum then keeping the maximum retard for the next cylinder firing;

comparing the number of firings of the next to fire cylinder without knocking to a predetermined number;

keeping the timing for the spark for the next cylinder firing the same if the number of firings of the next to fire cylinder since the last knock is under the predetermined number;

determining whether the timing has advanced to the maximum if the number of firings of the next to fire cylinder without knock exceeds the predetermined number;

keeping the maximum advance for the next cylinder firing if the timing is advanced to the maximum and there have been no knocks in the predetermined number of firings of the next to fire cylinder;

advancing the spark timing of the next cylinder firing if the timing is not advanced to the maximum and the number of firings of the next to fire cylinder without knock exceeds the predetermined number; and

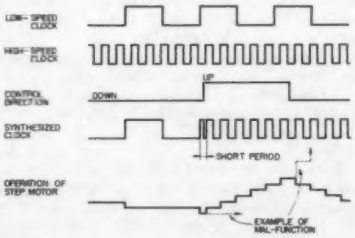
said steps of retarding and advancing the spark advance timing are being accomplished in predetermined increments.

4,376,430

AIR-FUEL MIXTURE RATIO CONTROL DEVICE

Shigetaka Takada, Ohbu, and Yukihiro Watanabe, Nagoya, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Jul. 10, 1981, Ser. No. 282,290
Claims priority, application Japan, Jul. 25, 1980, 55-102802
Int. Cl.³ F02B 33/00
U.S. Cl. 123—438 **8 Claims**



1. An air-fuel ratio control device having an exhaust gas sensor disposed in the exhaust system of an internal combustion engine; a control circuit adapted to produce, in accordance with the offset of the output from said exhaust gas sensor from a reference voltage corresponding to the desired air-fuel ratio, a control signal for making the air-fuel ratio of mixture to be supplied to said engine coincide with the command air-fuel ratio; and a mixture supplying means including means for adjusting said air-fuel ratio of said mixture in accordance with said control signal; wherein the improvement comprises that said means for adjusting the air-fuel ratio includes an actuator

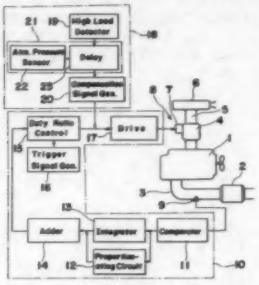
incorporating a step motor adapted to change the opening area of fuel passage of a carburetor or an air bleed passage of said carburetor; and that said control circuit has means for temporarily stopping said step motor for a predetermined time length before the stepping speed or the stepping direction of said step motor is changed.

4,376,431

AIR-FUEL RATIO CONTROL SYSTEM WITH ALTITUDE COMPENSATOR

Katsuhiko Yokoeku, and Katsuyoshi Iida, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Mar. 24, 1981, Ser. No. 247,083
Claims priority, application Japan, Mar. 29, 1980, 55-41080
Int. Cl.³ F02M *7/04*
U.S. Cl. 123—440 **5 Claims**



1. An air-fuel ratio control system for an internal combustion engine including a combustion chamber, a mixture intake passage means for supplying a combustible mixture to the combustion chamber, and exhaust passage means including a catalytic converter installed thereon between the engine and the atmosphere, said control system comprising a composition sensor provided on the exhaust passage means at a position between the engine and the catalytic converter for detecting the concentration of a particular component obtained in exhaust gases emitted from the engine, said concentration being a function of the air-fuel mixing ratio of the combustible mixture burned in the engine, a control unit receiving an output signal from the composition sensor and generating a control signal based on the output signal from the composition sensor, an actuator for regulating the air-fuel mixing ratio of the combustible mixture to be supplied to the combustion chamber in response to the control signal from the control unit, a high load compensator circuitry for bringing the actuator into a predetermined operative position for supplying a enriched combustible mixture to the combustion chamber in response to an occurance of a high load operating condition of the engine and irrespective of the application of the control signal to the actuator, and a delay circuitry operable in response to reduction in atomospheric pressure for delaying for a predetermined delay time the timing at which the actuator is brought into the predetermined operative position.

4,376,432

FUEL INJECTION PUMP WITH SPILL CONTROL MECHANISM

Charles W. Davis, Simsbury, Conn., assignor to Stanadyne, Inc., Hartford, Conn.

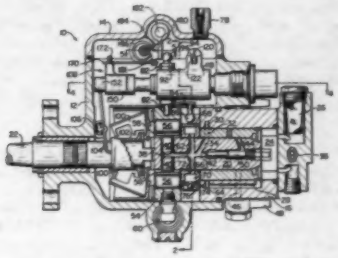
Filed Apr. 13, 1981, Ser. No. 253,208
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—450 **24 Claims**

1. In a fuel injection pump for an internal combustion engine:

a rotor including a charge pump for pressurizing measured charges of fuel for delivery to the engine, said rotor including a spill passage in communication with said charge pump;

a first annular member providing a cam ring surrounding said rotor and operatively coupled to said charge pump for actuating said charge pump upon rotation of said rotor, said cam ring being angularly adjustable to control the timing of the pressurized fuel delivery to the engine;

a second annular member providing a spill collar mounted adjacent to said cam ring and rotatably receiving said rotor, said spill collar including a spill port formed therein for diverting fuel flow from said charge pump upon registration of said spill passage in said rotor with said spill port in said collar;



crank means interconnecting said annular members for angular adjustment of said collar together with said cam ring and pivotally mounted on one of said annular members and connected to the other of said annular members for adjusting the angular position of said collar relative to said cam ring upon pivotal movement of said crank means on said one annular member to control the amount of fuel diverted from said charge pump; and

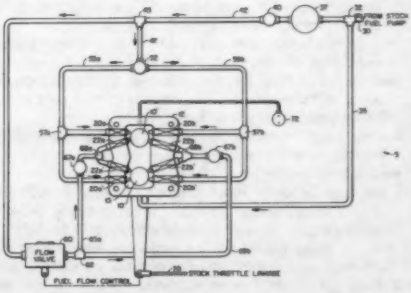
timing control means for angularly adjusting the cam ring for angularly adjusting said collar and said cam ring together and for angularly adjusting said collar relative to said cam ring with the crank means.

4,376,433

SUPPLEMENTAL FUEL INJECTION SYSTEM

Paul A. Spakowski, Pacifica, Calif., assignor to All American Fuel Systems, San Francisco, Calif.

Filed May 22, 1981, Ser. No. 263,796
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—478 **18 Claims**



1. A supplemental fuel injection system for use in conjunction with a fuel system including a carburetor, an intake manifold, and primary fuel supply means for providing liquid fuel to said carburetor at positive pressure, comprising:

first injector means operable to receive liquid fuel and atom-

ize said received liquid fuel into the air flowing from said carburetor;

second injector means operable to receive liquid fuel and atomize said received liquid fuel into the air flowing from said carburetor, said first and second injector means each including an impingement pin nozzle;

means for supporting portions of said first and second injector means proximate the induction port of said intake manifold;

mode selection means having first, second and third positions; and

supplemental fuel supply means responsive to said mode selection means operable to provide liquid fuel at a pressure substantially above said positive pressure to said first injector means when said mode selection means is in said first position, and to said second injector means when said mode selection means is in said second position, and further operable to prevent liquid fuel from reaching either of said first and second injector means when said mode selection means is in said third position.

4,376,434

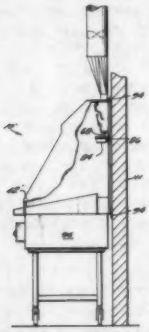
COOKING GRIDDLE VENTILATOR

Lawrence E. Stahl, Rocky Mount, N.C., assignor to Hardee's Food Systems, Inc., Rocky Mount, N.C.

Continuation of Ser. No. 67,331, Aug. 16, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,584

Int. Cl.³ F24C *15/20*

U.S. Cl. 126—299 D **7 Claims**



1. A ventilator for a generally rectangular, upwardly facing cooking station such as a griddle, comprising:

a downwardly and forwardly opening shroud which converges rearwardly and upwardly toward an outlet duct means forming a part thereof;

said shroud being characterized by a lack of inlet plumbing and a lack of water spray nozzles;

said shroud including a canopy having a throat region therewith, including means for removably mounting a slotted baffle panel across said throat region;

a slotted baffle panel removably mounted across said throat region via said mounting means;

said slotted baffle panel disposed within said canopy and having vertically short, laterally elongated baffled slot means therethrough having a predetermined facial area measuring no more than about one inch in height;

said mounting means further including an inclined grease gutter located downstream of said removable slotted baffle panel and having a lowest region and a collector positioned at said lowest region to collect grease draining thereinto from said gutter;

said shroud including two opposite end walls, a rear wall extending between said two opposite end walls from top to bottom, all three of which extend downwards at least to the level of said generally rectangular, upwardly facing cooking station, and a substantially shorter front wall having a lintel portion with a lower edge disposed about two feet above the level of said generally rectangular, upwardly facing cooking station; said lower edge defining the lower edge of said canopy, said opposite end walls defining corresponding opposite end walls of said canopy and said rear wall defining a corresponding rear wall of said canopy; said sidewalls at the bottoms thereof being substantially as deep, in a front to back sense, as said generally rectangular, upwardly facing cooking station; said canopy being substantially less deep than said cooking station and overlying a rearmost portion of said cooking station; and said sidewalls having front edges which extend obliquely rearwardly as they extend upwardly from the bottoms of said sidewalls to the canopy.

4,376,435

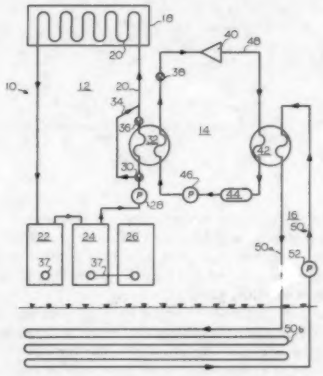
SOLAR POWERED AIR CONDITIONING SYSTEM

Charles D. Pittman, P.O. Box 592, Oldsmar, Fla. 33557

Filed Apr. 8, 1981, Ser. No. 252,147

Int. Cl.³ F24J *3/02*; **F25D** *23/12*

U.S. Cl. 126—435 **8 Claims**



1. An assembly for harnessing solar power to operate an air conditioning system, comprising,

a first conduit means defining a first closed loop element,

a first heat-absorbing fluid circulatable through said first loop element,

a second conduit means defining a second closed loop element,

a second fluid that has a low boiling point, relative to the boiling point of said first fluid, circulatable through said second loop element,

a first heat-exchanger means disposed in heat exchanging relation between said first and second loop element so that heat in said first fluid is transferred to said second fluid in amounts sufficient to vaporize said second fluid,

an engine expander means operatively connected in fluid communication to said first heat exchanger means so that said vaporized second fluid drives said engine expander means,

a third conduit means defining a third closed loop element,

a third heat-absorbing fluid circulatable through said third loop element,

a portion of said third loop element disposed in buried relation to the surface of the earth by a depth sufficient to cool said third fluid as it circulates through said buried portion,

a second heat-exchanger means disposed in heat exchanging relation between said second and third loop elements so that heat in said second fluid is transferred to said third fluid for the purpose of returning said second vaporized

fluid to its liquid state prior to re-entry of said second fluid into said first heat-exchanger means,

whereby said engine expander means provides useful work responsive to heating of said first fluid by the sun, vaporizing by said first fluid of a second fluid which drives said engine expander means, and condensation of said second fluid, for subsequent reevaporation, by a third fluid made relatively cooler than said second fluid in a fourth heat-exchanger means provided by the earth.

4,376,436

HOUSEHOLD HOT WATER SYSTEMS

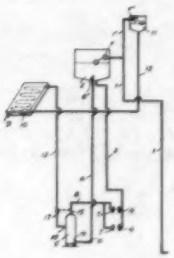
Victorio Tacchi, 50 Rioja St., 1st Floor, Cordoba, Argentina

Filed Aug. 18, 1980, Ser. No. 178,732

Claims priority, application Argentina, Aug. 28, 1979, 277,878

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—437 **8 Claims**



1. Arrangement for transferring water heated by solar energy at an upper level, to a lower level for use thereat, the arrangement comprising:

(1) a water tank positioned at a first level; said tank being adapted to receive water from cold water supply mains, said tank having an outlet;

(2) means for heating the water and comprising a solar energy receiving panel, said water heating means having a cold water inlet and a hot water outlet; said cold water inlet being connectable to a source of cold water at a pressure greater than the pressure created by the level of water in said water tank;

(3) a water heating and storing arrangement positioned at a level below said first level and having a hot water outlet, a hot water inlet and a cold water inlet, said hot water outlet being adapted to supply hot water for use upon demand, the hot water having been heated by said solar energy or, in absence of the provision of solar energy, by conventional heating in said heating and storing arrangement;

(4) a first conduit connecting the hot water outlet of said water heating means with the hot water inlet of said water heating and storing arrangement;

(5) a second conduit having an end portion connected to the outlet of said water tank and an end portion connected to said cold water inlet of said water heating and storing arrangement so that water is flowable into said second conduit from said water heating and storing arrangement when hot water is introduced into said water heating and storing arrangement through said hot water inlet; and

(6) a thermostatic control valve in said water heating means for controlling the flow of water as a function of the temperature of the water.

4,376,437

TOPICAL ENVIRONMENTAL DEVICE

Benson R. Sundheim, 127 Deertrack La., Irvington-on-Hudson, N.Y. 10533; Richard F. Grady, 42 N. Fullerton Ave., and George C. Brumlik, 154 Upper Mountain Ave., both of Montclair, N.J. 07042

Continuation-in-part of Ser. No. 923,281, Jul. 10, 1978, abandoned, which is a continuation of Ser. No. 803,108, Jun. 3, 1977, abandoned, which is a continuation of Ser. No. 700,700, Jun. 29, 1976, abandoned, which is a continuation of Ser. No. 504,600, Sep. 9, 1974, abandoned. This application Jul. 19, 1979, Ser. No. 58,656

Int. Cl.³ A61H *33/00*; A61M *35/00*; A61N *1/30*

U.S. Cl. 128—82.1 **19 Claims**

1. An apparatus for the treatment of a human body which comprises an enclosure defined by at least one wall, said enclosure adapted to be placed on said body, said enclosure having at least one opening defining an open treating zone adapted to at least partially contain said body, at least one seal attached to said enclosure and disposed about said opening, said seal adapted to seal the contents of said enclosure from the environment outside of said enclosure, an inlet conduit terminating within said enclosure and passing through said wall, a source of liquid disposed outside said enclosure, said inlet conduit being in liquid flow communication with said source of liquid disposed outside said enclosure, means for causing said liquid to flow, under pressure, from said source through said inlet conduit into said enclosure, an impeller disposed within said enclosure, said impeller disposed opposite the terminus of said inlet conduit and in the path of flow of liquid passing through said inlet conduit, said impeller being disposed a distance away from the terminus of said inlet conduit whereby when liquid from said inlet conduit strikes said impeller, said liquid becomes disposed in said enclosure in a state of turbulence and flows towards said open treating zone, said apparatus further comprising an exit conduit from said enclosure.

4,376,438

METHOD OF PRODUCING A SUPPORTING BANDAGE AND BANDAGING MATERIAL SUITABLE FOR THIS PURPOSE

Franz A. Straube, and Günther Lehnert, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 968,657, Dec. 11, 1978, abandoned, which is a continuation of Ser. No. 785,794, Apr. 8, 1977, abandoned. This application Apr. 16, 1981, Ser. No. 254,681

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651089

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—90 **15 Claims**

1. Process for the preparation of a rigid supporting bandage for surgical or veterinary surgical use which attains weight bearing strength in from five to about fifteen minutes comprising covering the part of the body which requires support with an air-permeable dressing and then applying a self-hardening bandage, characterized in that the self-hardening bandage comprises strips of air-permeable, flexible bandaging fabric which have been impregnated and/or coated with about 50 to 300% by weight, based on the uncoated fabric, of an isocyanate prepolymer which contains free isocyanate groups and has been prepared from aromatic polyisocyanates and polyols containing tertiary amine nitrogen atoms, the prepolymer having an isocyanate content of about 5 to 30% by weight and

a tertiary amino nitrogen content of about 0.05 to 2.5% by weight, the impregnated and/or coated bandaging fabric being soaked with water immediately before its use.

4,376,439

SUCTION BOTTLE FOR MEDICAL PURPOSES PARTICULARLY FOR THE CONNECTION OF DRAINAGE TUBES

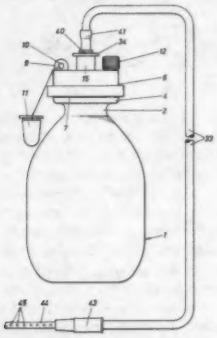
Friedrich G. Lauterjung, Schallstr. 6, 5000 Cologne 41, Fed. Rep. of Germany

Filed Apr. 4, 1980, Ser. No. 137,154

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917332; Mar. 27, 1980, 3011799

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—276 **11 Claims**



1. In a suction bottle for medical purposes, and particularly for the connection of drainage tubes, having a valve located in the drainage path, a closure part which can be brought into an open position and a vacuum indicator, the improvement comprising

a flat plug constituting the closure part,

a nipple communicating with an interior of the suction bottle, said nipple being formed with transverse openings and having an inner end,

said flat plug being disposed longitudinally displaceable within said nipple of the suction bottle, said flat plug being displaceable in said nipple, from a basic position thereof on the outside of said transverse openings of the nipple whereby the transverse openings communicate via said nipple with the interior of the suction bottle, inwardly past said transverse openings into a closing position just in front of the inner end of said nipple,

a drainage-tube connecting plug removeably positioned in said nipple and having a sealing place sealingly engaging said nipple and an end edge constituting a ram for pushing said flat plug inwardly into said interior of the suction bottle,

said flat plug in said closing position being located at a greater distance from said transverse openings than the distance between said end edge and said sealing place of said drainage-tube connecting plug.

4,376,440

SANITARY NAPKIN WITH ADHESIVE ATTACHMENT MEANS

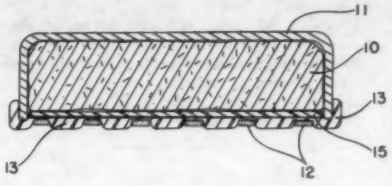
Howard A. Whitehead; Robert J. Roeder, and Herbert E. Grube, all of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 5, 1980, Ser. No. 175,300

Int. Cl.³ A61F *13/16*

U.S. Cl. 604—387 **13 Claims**

1. A sanitary napkin including an absorbent matrix and a fluid impervious baffle having an irregularly contoured undergarment facing surface including recessed areas, said recessed areas containing pressure sensitive adhesive with an outward surface having substantial resistance to aging, and said adhesive surface exposed only when the napkin is flexed, said napkin manufactured without a separate disposable component for shielding said adhesive.



4,376,441

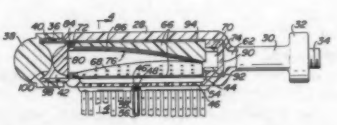
HAIR TREATMENT APPLICATOR

Theodore Duncan, 8400 Lindberg Blvd., Apt. 410, Philadelphia, Pa. 19153

Filed Oct. 14, 1980, Ser. No. 196,904

Int. Cl.³ A45D *24/22*

U.S. Cl. 132—9 **15 Claims**



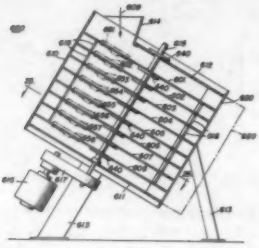
1. A compact device for applying a hair treatment preparation liquid to hair comprising an applicator assembly and remotely located means for producing a stream of heated air and for supplying said air stream through flexible conduit means to said applicator assembly, said applicator assembly being readily manipulatable and comprising a hand grasping portion and a body portion, said body portion including a dispensing chamber, said dispensing chamber including an access port, replaceable capsule means and filter means, said access port enabling the insertion and removal, respectively of said capsule means from said chamber, said capsule means being hollow for receipt of a mass of viscous hair treatment liquid preparation and having at least one dispensing aperture and an inlet opening communicating with the interior of said capsule means, said filter means being coupled between said inlet opening and said conduit means for allowing said heated air to pass therethrough while precluding said preparation liquid from passing therethrough, said body portion also comprising a plurality of teeth in the form of hollow tubular projections extending outward from said body portion, the interior of each of said teeth being in communication with the interior of said capsule means and each of said teeth including at least one dispensing aperture, said dispensing chamber receiving said heated air stream from said conduit means whereupon said heated air passes through said filter means, into said capsule means to cause said viscous liquid to melt within said capsule means and to flow thereout through the dispensing apertures in said teeth for application to hair.

4,376,442

COIN ASSORTER

Jim H. Gomez, Kankakee, and Jose E. Davila, Bourbonnais, both of Ill., assignors to General Railway Signal Company, Rochester, N.Y.

Division of Ser. No. 855,970, Nov. 30, 1977, Pat. No. 4,210,801.
This application May 14, 1980, Ser. No. 149,719
Int. Cl.³ G07D 3/10
U.S. Cl. 133—3 C 12 Claims



1. A coin sorter comprising a stack of plates mounted for rotation within a peripheral housing about an axis inclined to the horizontal, the number of plates being at least equal to the number of different sizes of coins to be sorted, the plates each having a plurality of openings therein of a size slightly smaller than the size of the coins to be retained thereon, the openings in the plates increasing in size from the bottommost plate toward the topmost plate, a coin entry chute disposed above the uppermost plate for depositing a mixture of different sizes of coins thereon, pairs of cooperating projections arranged around each plate adjacent to the outer periphery thereof for catching a coin along the lower portion of the path of travel of said plate and for carrying the coin upwardly and past the highest portion of the path of travel of said plate, and a plurality of discharge openings respectively associated with said plates extending through said housing and disposed adjacent to the outer periphery of the associated plate just below the highest portion of the path of travel thereof to receive the coins carried by said cooperating pairs of projections one-by-one thereinto.

4,376,443

JET WATER CLEANING APPARATUS

Clement R. Mondy, Jr., Houston, Tex., assignor to Stewart & Stevenson Services, Inc. and Job-Master Sales, Inc., both of Houston, Tex., a part interest

Filed Aug. 24, 1981, Ser. No. 295,296
Int. Cl.³ B08B 3/02
U.S. Cl. 134—168 R 10 Claims

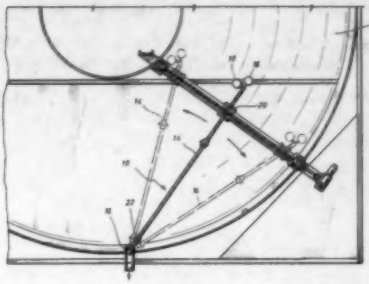
1. A water cleaning apparatus comprising,

a rigid water conduit manifold,

a rotary swivel connection attached to one end of the conduit whereby said conduit may pivot at said one end, said swivel connection adapted to be connected to a water pump for supplying high pressure water to the manifold,

a plurality of jet nozzles connected to the manifold for receiving and dispersing high pressure water,

means for rotating the jet nozzles about an axis offset from the axis of said nozzles, and



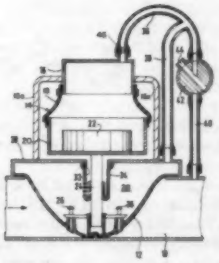
means connected to the manifold for reciprocating said manifold and nozzles about the swivel connection.

4,376,444

VACUUM OPERATED CHECK VALVE FOR VACUUM CONDUITS

Harald Michael, Hamburg, Fed. Rep. of Germany, assignor to Electrolux GmbH, Fed. Rep. of Germany

Filed Aug. 28, 1979, Ser. No. 70,531
Int. Cl.³ F17D 3/00; F16K 31/126
U.S. Cl. 137—1 10 Claims



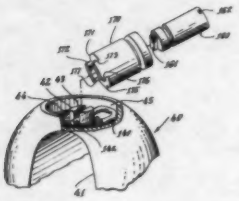
10. A method of operating a check valve for vacuum pipes or conduits wherein the valve comprises a diaphragm which is movable into a first position wherein the valve is closed by the suction pressure within the pipe in which the check valve is located, and a piston and cylinder unit for moving the diaphragm into a second position wherein the valve is open, a cavity being provided on the side of the diaphragm opposite to that which is exposed to suction pressure with the pipe, said method comprising selectively supplying suction pressure from the pipe so as to at least partly balance the suction pressure on the diaphragm and thereafter applying suction pressure from the pipe to the cylinder of said piston and cylinder unit to cause said unit to rapidly move the diaphragm to the second position thereof thereby providing fast opening of the valve.

4,376,445

SELF-CLOSING BREAKAWAY VALVE ASSEMBLY INCLUDING IMPROVED VALVE MOUNTING WITH ROTATION LIMITING STOP

Daniel T. Melsenheimer, Jr., 404 Longmeadow, Orange, Conn. 06477

Division of Ser. No. 10,745, Feb. 9, 1979, Pat. No. 4,301,823. This application Jul. 27, 1981, Ser. No. 287,430
Int. Cl.³ F16K 17/40
U.S. Cl. 137—68 R 11 Claims



1. An improvement in self-closing breakaway valve assemblies of the type comprising:

(A) a first valve housing having a first rotatable valve member rotatably mounted therein, said first valve housing and first rotatable valve member each having a bore formed therethrough, said bores being aligned when said first rotatable valve member is in an open position to provide a passage through said first valve housing, and said bores being misaligned to block the passage through said first valve housing when said first rotatable valve member is rotated to a closed position;

(B) a second housing having a bore formed therethrough;

(C) frangible means connecting said first valve housing and second housing with the bores formed therethrough in alignment; and

(D) means holding the first rotatable valve member in its open position and releasing the first rotatable valve member upon separation of the first valve housing and second housing to permit the first rotatable valve member to rotate to its closed position,

wherein the first rotatable valve member has first and second trunnion shafts disposed along its desired pivot axis and wherein the improvement comprises valve member mountings with rotation limiting stops including:

(1) first and second trunnion bearings defining openings respectively rotatably receiving the first and second trunnion shafts of the first rotatable valve member, the trunnion bearings fixedly mounted in the first valve housing to mount the first rotatable valve member for rotation about the desired pivot axis, the first trunnion bearing defining an arcuate slot having a stop surface; and

(2) a first coil spring for spring biasing said first rotatable valve member to rotate from its open position to its closed position, the first coil spring deployed about the first trunnion shaft of the first rotatable valve member and having a first tang end secured to the first valve housing and a second tang end extending through the arcuate slot of the first trunnion bearing and engaged with the first trunnion shaft;

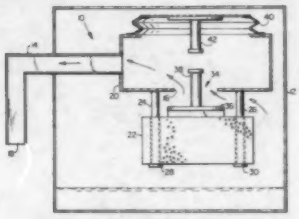
whereby when the first rotatable valve member is released, it rotates to its closed position where the second tang end of the coil spring grounds against the stop surface of the trunnion bearing to limit further rotation of the first rotatable valve member and to hold it at its closed position.

4,376,446

VENT VALVE FOR FUEL TANKS AND THE LIKE

Benjamin S. Liff, West Hartford, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Mar. 15, 1978, Ser. No. 886,808
Int. Cl.³ F16K 17/02
U.S. Cl. 137—202 16 Claims



1. A vent valve for a fuel tank and the like for performing both venting and pressure relieving functions comprising:

a valve housing defining inlet and exit openings in fluid communication through an internal fluid passageway for venting fluids in a tank through the passageway from the inlet opening to the exit opening;

movable closure means associated with the valve housing for closing the fluid passageway and preventing fluid flow through the valve housing between the inlet and exit openings, the closure means including a float having a substantially fixed buoyancy and movable relative to the valve housing by buoyant forces of liquid in the tank, the float having upper and lower positions established by the liquid level in the tank and in the upper position causing the closure means to close the fluid passageway and the tank, and in the lower position causing the closure means to open the fluid passageway and freely vent the tank; and

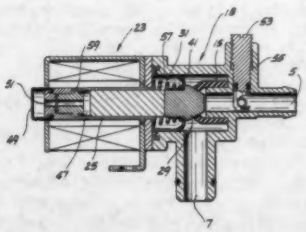
pressure responsive actuating means responsive to the pressure in the tank above the liquid in both the open and closed positions of the passageway and operatively associated with the movable closure means at the upper position of the float for opposing closure of the fluid paassageway by the float at tank pressures above a preselected level and depressing the float from the upper position in opposition to the buoyant forces of the liquid to open the fluid passageway and relieve pressures within the tank.

4,376,447

HOT WATER VALVE

Calvin L. Chumley, St. Louis, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 67,816, Aug. 20, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,190
Int. Cl.³ F16K 31/06, 1/38, 1/42, 25/00
U.S. Cl. 137—244 18 Claims



1. A valve comprising:

a body having a chamber therein, a fluid inlet port and a fluid outlet port in communication with the chamber, an opening for a valve plunger, and a nipple extending into the chamber, the nipple having a passage therethrough constituting one of said ports;

a valve plunger extending through the opening in the body movable toward and away from an end of the nipple, said plunger having a generally conical valve member at its end toward the nipple in axial alignment with the passage in the nipple; and

a sleeve of resilient material secured to the nipple in stretched surrounding relation with respect to the nipple, the sleeve being of generally circular section and having a portion extending beyond the end of the nipple, the inner surface of the extending portion of the sleeve at the free end thereof being countersunk, thereby forming a frustoconical valve seat;

said valve member being engageable with said frustoconical seat for blocking fluid flow through said one port;

the angle of said frustoconical seat relative to the axis of the sleeve being at least as great as the angle of said conical valve member relative to the axis of the sleeve, whereby the valve member, on entry into the sleeve, engages the inner end of said frustoconical seat and on continued movement in the direction toward the nipple, expands the extending portion of the sleeve and sealingly engages the frustoconical seat, said valve member, in moving into the sleeve, wiping the frustoconical seat to remove scale which may have deposited on the seat and on the portion of the valve member engageable with the seat.

4,376,448

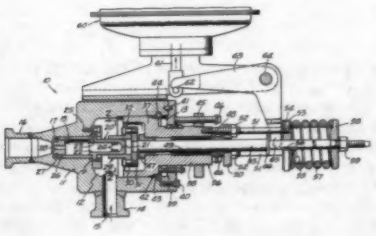
LET-DOWN VALVE

Evert B. Skough, Westminster, Calif., assignor to Mark Controls Corporation, Evanston, Ill.

Filed Jan. 26, 1981, Ser. No. 228,124

Int. Cl.³ F16K *43/00*; F17D *3/00*; F16K *47/04*

U.S. Cl. 137—329.02 **6 Claims**



1. In a let-down valve having a body with walls defining a cavity, pressurized fluid inlet and outlet openings in the body walls in communication with the cavity, an orifice plug located within the cavity having walls interposed between the inlet and outlet openings, at least two orifices in said plug walls arranged to direct pressurized fluid from the inlet opening into two respective streams impinging upon each other prior to exiting via the outlet opening, the improvement comprising:

said orifice plug being generally a hollow cylinder with one end closed and the other end received over the outlet opening, a plurality of even number sets of orifices formed in the orifice plug side wall and circumferentially arranged and equally spaced,

a valve stem having parts located within the valve body cavity and other parts slidably extending through an opening in said body and terminating externally of said body; and

means carried by the valve stem parts within the cavity including a hollow sleeve slidingly received on the orifice plug, said sleeve being affixed to parts of the valve stem lying in the cavity and having a pair of openings in the sleeve side wall on opposite sides thereof which can be adjustably positioned to selectively uncover a first pair of diametrically located orifices, and said sleeve being rotatable by the valve stem to expose selectively other pairs of orifices originally covered by said sleeve and to cover the first pair of orifices.

4,376,449

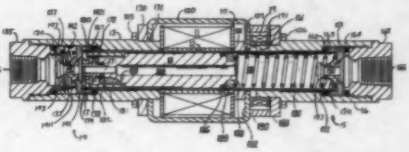
TWO RESERVOIR SYSTEM IN WHICH FLUID IS DRAWN FROM ONE TO MAINTAIN A LEVEL IN THE OTHER

Robert M. Nelson, Willow Springs Village, Rte . 1, Box 215, Rosamond, Calif. 93560, and Robert E. Nelson, Rosamond, Calif., assignors to Robert M. Nelson, Rosamond, Calif.

Filed Feb. 14, 1980, Ser. No. 121,463

Int. Cl.³ F17D *1/00*

U.S. Cl. 137—391 **11 Claims**



1. In a fluid system, a primary reservoir in which a liquid level is to be maintained, a sensor adapted to draw fluid from said primary reservoir at said level and to produce a sensing signal when other than liquid is so drawn, a secondary reservoir, and pump means to transfer liquid from said secondary to said primary reservoir only in response to said sensing signal, said sensor having a capability of responding to the opposition of a fluid to its own physical displacement, and comprising: a body having a cavity therein, and flow conduit means enabling entry and exit of fluid to and from said cavity; a fluid displacement member movable in order to vary the volume within said cavity which is available to be occupied by said fluid; force means adapted to give repetitively a known impetus to said fluid displacement member for the purpose of moving it repetitively to change said volume; and sensing means responsive to the motion developed by said member in response to said impetus, as such motion may vary with the varying opposition of said fluid to its own physical displacement by said member, to produce said sensing signal respective to such opposition.

4,376,450

VALVE POSITION MONITOR AND CONTROL SYSTEM

Robert W. Fayfield, Excelsior, and Kenneth B. Fontaine, Maple Grove, both of Minn., assignors to Scovill Manufacturing Co. - Scovill, Inc., Waterbury, Conn.

Filed Jul. 3, 1978, Ser. No. 921,443

Int. Cl.³ F16K *37/00*; F17D *3/00*

U.S. Cl. 137—554 **4 Claims**

1. A valve position monitor and control circuit for an electrically operated valve unit including at least two movable elements representative of the open or closed position of at least two valves of the valve unit, said circuit comprising:

detection means positionable with respect to each of the movable elements of the valve unit to provide output signals representative of the position of the valves;

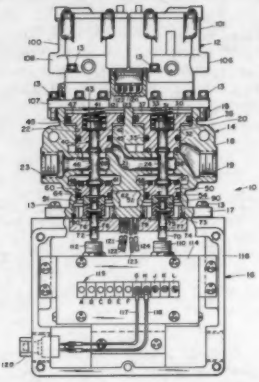
valve actuation circuit means for providing command control signals for application to the valve unit to operate the electrically actuated valves of the valve unit,

comparator circuit means coupled to said detection means and to said valve actuation circuit means for comparing the command control signals with signals from said detection means to determine if the valves are in the position commanded and to provide electrical output signals representative of such determination;

circuit means couples to said comparator circuit and to said

valve actuation circuit means to deactivate said valve actuation circuit means when the actual position of a valve does not correspond to a commanded position, wherein said circuit means includes a delay circuit means coupled to said comparator for delaying the electrical signals therefrom for a predetermined time to permit a valve to respond to a valve control signal from said actuator circuit means; and

wherein said comparator has two output terminals and said circuit means further includes first and second pairs of



solid state switches one of the switches of each pair having a control input terminal coupled to one output terminal of said comparator and the other of the switches of each pair having a control input terminal coupled to the remaining output terminal of said comparator, said valve actuation circuit means includes two control relays, wherein one pair of said solid state switches is coupled to one of said control relays and the other pair of said solid state switches is coupled to the remaining control relay to selectively apply power to said relays in response to signals from said comparator.

4,376,451

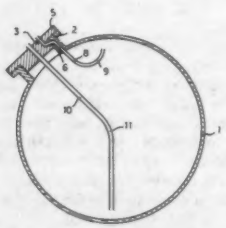
CONTAINER

Pierre Bouron, Amboise; Maurice Robineau, St-Pierre des Corps, and Alain Thiery, Neuilly sur Seine, all of France, assignors to Societe Metallurgique Liotard Freres, Paris, France

Filed Mar. 23, 1981, Ser. No. 246,181

Int. Cl.³ F16K *24/00*; F17C *13/06*

U.S. Cl. 137—588 **5 Claims**



1. Container comprising a receiver of a pressure-resistant material and provided with seating which has an inner sideface and which defines an opening, a closure member which closes the opening, a passage disposed in the closure member, a bore disposed in the seating, one end of the bore opening into the receiver and the other end of the bore issuing from the inner side face of the seating and the passage abutting against said latter end, the bore being extended into the interior of the receiver by a tube which is angled in the direction of the top of the receiver, and a conduit extending through the closure member but not through the seating, opening into the receiver and which is angled in the interior of the receiver in a direction different to that according to which the tube is angled.

4,376,452

SYSTEM FOR LOADING LIQUIDS

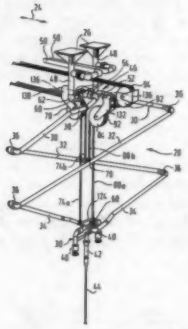
Hans Tax, Potsdamer Strasse 3, D-8000 Munich 40, Fed. Rep. of Germany, and Klaus Hösler, Eichenau, Fed. Rep. of Germany, assignors to Hans Tax, Munich, Fed. Rep. of Germany

Filed Nov. 8, 1980, Ser. No. 205,288

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945768

Int. Cl.³ B67D *5/00*

U.S. Cl. 137—615 **20 Claims**

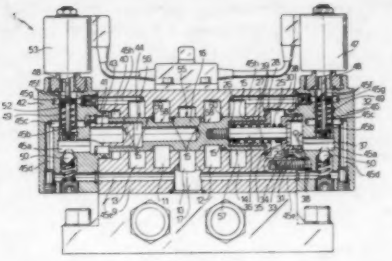


1. A loading system for liquid loads comprising: a system of liquid flow conduits articulated in the form of lazy tongs and including a lower intermediate joint and at least one additional intermediate joint thereabove; a beam having said lazy tongs system suspended therefrom for adjustable movement in the vertical direction; a first hoisting rope system having said lower intermediate joint suspended therefrom for effecting vertical adjustment thereof; and an additional hoisting rope system having said additional intermediate joint suspended therefrom for effecting vertical adjustment thereof; said hoisting rope systems being cooperatively related with regard to their adjusting speed corresponding to the speed of said intermediate joints effected by the geometry of said lazy tongs system; with at least one hoisting rope connected to a hoisting rope drive being common to both said hoisting rope systems; said lazy tongs system being suspended from said beam on a beam carriage movable along a track provided on said beam, wherein said hoisting rope drive is arranged outside of said beam carriage and wherein the rope lines of said hoisting rope systems are so guided along said track over guide rollers of said beam carriage that the beam carriage is movable along said track without influencing the vertical positions of said intermediate joints of said lazy tongs system relative to said beam carriage; said system including one hoisting rope which is coupled at one end with said lower intermediate joint and which extends over a first guide roller in said beam carriage, over a guide roller connected to said hoisting rope drive, over a guide roller secured on said track and over a second guide roller on said beam carriage to said additional intermediate joint of said lazy tongs system.

4,376,453
HYDRAULIC DISTRIBUTOR

Luciano Moretti, and Giulio Dotti, both of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Oct. 29, 1980, Ser. No. 201,995
Claims priority, application Italy, Oct. 30, 1979, 69116 A/79
Int. Cl.³ F15B 13/043
U.S. Cl. 137—625.64 7 Claims

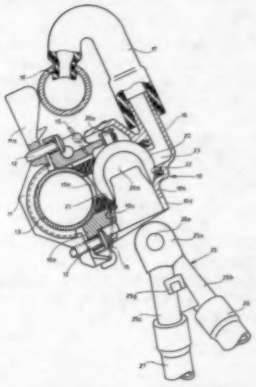


1. A distributor for a hydraulic circuit, which is designed to control the supply of a fluid under pressure into a chamber of a hydraulic actuator and the outlet of the said fluid from another chamber of said actuator, said actuator having a movable member responsive to fluid pressure in the chambers of said actuator, said distributor comprising a first chamber and a second chamber designed to be selectively communicated with one of said chambers of the actuator, and a single slide valve movable within said first and second chambers in the direction of its axis in a corresponding seat of the distributor and designed to adopt a first position, in which it connects hydraulically said first chamber of the distributor to a source of fluid under pressure and, simultaneously, said second chamber of the distributor to a fluid outlet, and to adopt a second position, in which it connects hydraulically said second chamber of the distributor to said source of fluid and, simultaneously, said first chamber of the distributor to said fluid outlet, restoring means normally holding said slide valve in a rest position in which it prevents any communication between either of said two distributor chambers and between said fluid source and said fluid outlet, characterized in that said restoring means comprises means responsive to the pressure prevailing inside said first and second chambers of the distributor, means for choking the outlet cross-section for the fluid from said first and second chambers of the distributor, said pressure-responsive means being connected to said choking means so that, as a result of a reduction in the fluid pressure in said first or second chamber of the distributor, caused as a result of a displacement of the movable member of said actuator at a velocity higher than a predetermined velocity, said choking means brings about a decrease in said outlet cross-section from said second or first chamber of the distributor, respectively, so as to cause an increase in the pressure in one of said chambers of the actuator in order to reduce the velocity of said movable member, said slide valve having first and second active surfaces, the actuation of said slide valve from said rest position towards said first or second position being effected by causing said fluid to act, respectively, on the first or second active surface of the slide valve itself, whereas the outlet pressure acts, respectively, on said second or first active surface, said pressure-responsive means comprising a first duct and a second duct which communicate said first and second chamber of the distributor, respectively, with said first and second active surface, and which are designed to transmit at any moment the pressure prevailing in said first and second chamber, respectively, to said first and second active surfaces, in such a way as to cause the slide valve of said distributor to adopt at any moment a predetermined axial position depending on said pressure, and said means for choking the outlet cross-section comprising a first intermediate chamber disposed between said first chamber and said fluid outlet and a second intermediate chamber disposed between said second chamber and said fluid outlet, each of said first and second chambers being communicated, respectively, with said first and second intermediate chambers through a corresponding bore traversed by a portion of said slide valve, there being provided on each of said portions of the slide valve a first control surface shaped so as to vary continuously the passage cross-section formed between said portions and the corresponding bore, as a function of the axial displacement of the slide valve.

4,376,454
VALVE

Klaus Schulte, Mölnbo, Sweden, assignor to Alfa-Laval, Inc., Poughkeepsie, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,850
Claims priority, application Sweden, Mar. 7, 1980, 8001789
Int. Cl.³ F16K 5/20; F16L 37/28; A01J 7/00
U.S. Cl. 137—798 5 Claims



1. In combination with two pipe lines, such as a milk line and a vacuum line of a milking system, a valve for connecting said pipe lines to a machine, such as a milking machine, the valve comprising a housing attached to one of said pipe lines, a slide rotatable in the housing, the housing having two openings communicating respectively with said two pipe lines, a pair of valve seats surrounding said two openings, respectively, and located in diametrically opposite positions in the housing, said slide having sealing surfaces cooperating with said valve seats and also having a recess, a connection piece insertable in said recess and having opposite openings, and a pair of hoses of said machine connected to said opposite openings, respectively, the connection piece having sealing surfaces surrounding said opposite openings and cooperating with said valve seats when the connection piece is inserted in said recess, said piece being operable in said recess to rotate the slide between a connected position in which the hoses are connected to respective ones of said pipe lines and a disconnected position in which the hoses are disconnected from said pipe lines.

4,376,455
EIGHT HARNESS PAPERMAKING FABRIC

Edward R. Hahn, Neenah, Wis., assignor to Albany International Corp., Albany, N.Y.

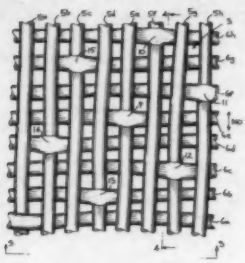
Filed Dec. 29, 1980, Ser. No. 220,806
Int. Cl.³ D03D 15/00; D21F 1/10; B01D 39/10
U.S. Cl. 139—383 A 11 Claims

1. In a papermaking fabric having machine direction and cross machine direction thread systems that interlace with one

another to form thread knuckles in each thread system on opposite sides of the fabric, the combination of:

a weave repeat pattern of eight crossovers for each thread system;

the cross machine direction threads having long knuckles of at least six crossovers in length on the paper forming side of the fabric;



the machine direction threads having binding knuckles on the same fabric side of a single crossover;

the long knuckles of the cross machine direction threads on the paper side of the fabric extend outwardly of the machine direction thread knuckles; and

the threads of both thread systems are of a polymeric material.

4,376,456

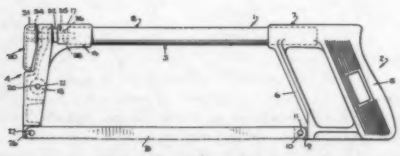
HACK SAW FRAME

Daniel Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,925

Int. Cl.³ B27B *21/02*

U.S. Cl. 145—33 A 3 Claims



1. A hack saw frame comprising a handle assembly, a body assembly and a front assembly, means for holding a blade between said handle assembly and said front assembly, said front assembly being pivotly movable relative to said handle assembly in order to permit said blade-holding means to loosen or tighten its grip on a blade, said front assembly is pivotly mounted on a front portion of the body assembly, a locking assembly being provided to pivot said front assembly around its pivot mounting, said locking assembly comprising a knob in front of said front assembly and a threaded member extending rearwardly therefrom into said body portion whereby rotation of the threaded member will permit the front assembly to pivot.

4,376,457

EASY-ON TIRE CHAINS

Carl D. Guenther, 7900 Airlane Ave., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 150,458, May 16, 1980, Pat. No. 4,324,278. This application Mar. 15, 1982, Ser. No. 357,906

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—213 R 13 Claims

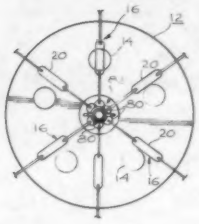
1. A tire chain assembly adapted for use on wheels mounted to hubs on motor vehicles comprising:

a shaped disc adapted to be secured between a wheel and a hub, said disc projecting radially outwardly from its mounting and defining a plurality of anchoring apertures circumferentially spaced about the outward projection thereof;

a plurality of elongated chain sections, each chain section comprising:

(a) a pair of hook elements at opposite ends thereof for attaching to the disc at generally diametrically opposite anchoring apertures thereon,

(b) two pairs of tread chain segments, the segments of a pair being fastened at one end to a corresponding hook element at points spatially separated from each other,



the segments being attached at their other ends to corresponding ends of an intermediate chain, and

(c) an intermediate chain joining the pairs of tread chain segments for extending diametrically across the face of a wheel when the chain section is mounted in operative position in order to permit independent mounting of the chain section and establish traction for the wheel independently of other sections of the assembly; and

a releasable fastener for securing together the intermediate chains at a point where they intersect with each other in the vicinity of the center of the assembly.

4,376,458

BEAD RINGS OF PNEUMATIC TIRES

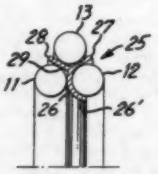
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissments Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 796,681, May 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,123, Jan. 26, 1976, abandoned. This application Nov. 6, 1981, Ser. No. 318,802

Claims priority, application France, Jan. 29, 1975, 75 02872

Int. Cl.³ B60C *15/04*

U.S. Cl. 152—362 R 8 Claims



1. A pneumatic tire having (a) a bead reinforcement which comprises at least one composite bead ring formed of three unitary bead rings at least two of which are of the stranded type and are formed of a plurality of steel wires, the radial cross sections of the three unitary bead rings being arranged along the three apices of a triangle which is fixed with respect to the rotational axis of the tire, and (b) a sidewall reinforcement folded around the composite bead ring, characterized by the fact that an annular trifurcated element is arranged be-

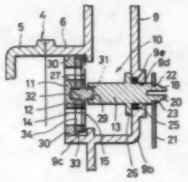
tween the unitary bead rings so that each of the three branches of the annular trifurcated element is tangent to the radial cross sections of two and of only two of the unitary bead rings, the ends of said branches being located on the inside of the apparent surface defined by the outer contour of the composite bead ring; the annular trifurcated element having the terminal portion of at least one of its branches shaped so as to form a groove which partially surrounds a unitary bead ring.

4,376,459

HEAT EXCHANGER

Masaru Nagashima, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 110,330
Claims priority, application Japan, Jan. 30, 1979, 54-10181[U]
Int. Cl.³ F28F 27/00
U.S. Cl. 165—96 4 Claims



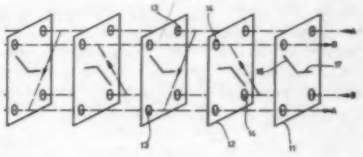
1. A heat exchanger which comprises:
a plurality of tubes;
a plurality of fins secured to said tubes;
a pair of tanks connected to opposite ends of said tubes;
an inlet pipe formed integrally with one of said tanks for introducing thermal medium fluid into said one tank; and
a valve means arranged at a junction of said one tank and said inlet pipe for controlling the flow rate of said thermal medium fluid flowing into said one tank through said inlet pipe;
said valve means comprising:
a valve seat arranged at the junction of said one tank and said inlet pipe in a manner traversing the flow of said thermal medium fluid, said valve seat having at least one through hole formed between a center thereof and a periphery thereof;
a valve body having an axis, said valve body being disposed in close contact with said valve seat for rotation about said axis of the valve body relative to said valve seat, said valve body having at least one through hole formed between a center thereof and a periphery thereof;
said at least one through hole of said valve seat being registrable with an associated one of said at least one through hole of said valve body, the registered area of said at least one through hole of said valve body and said associated through hole of said valve seat being variable as said valve body rotates to thereby vary the flow rate of said thermal medium fluid passing through said through holes;
said valve body comprising a thin deformable disk member which is deformable by the pressure of said thermal medium fluid in contact therewith, said valve body being located upstream of said valve seat in a flow passage of said thermal fluid formed in said inlet pipe, said valve body being deformed and urged against said valve seat substantially solely by the pressure of said thermal medium fluid flowing into said one tank through said inlet pipe;
a sheet member interposed between said valve body and said valve seat for keeping fluid tightness therebetween, said sheet member being secured to one of said valve seat and said valve body;
a rotary shaft arranged in said inlet pipe at a side of said valve body remote from said valve seat and operable from the outside of said heat exchanger, said rotary shaft having a recess formed in one end face thereof;
a single driven shaft integrally formed on said valve body, said single driven shaft being axially projected toward said rotary shaft and having an end inserted in said recess of said rotary shaft for rotation in unison therewith and being displaceable axially thereof;
an O-ring interposed between said rotary shaft and an inner wall of said inlet pipe;
said inlet pipe having a through hole formed therein in the neighborhood of the junction of the inlet pipe and said one tank;
a collar radially formed on an intermediate portion of said rotary shaft, said collar being placed in contact with said inner wall of said inlet pipe with said O-ring interposed between said collar and said inner wall of said inlet pipe; and
said rotary shaft having one end thereof projecting outwardly of said inlet pipe through said through hole of said inlet pipe such that said collar of said rotary shaft sealingly engages said inner wall of said inlet pipe with said O-ring interposed between said collar and said inner wall of said inlet pipe.

4,376,460

PLATE HEAT EXCHANGER

Malte Skoog, Lund, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Dec. 22, 1980, Ser. No. 218,697
Claims priority, application Sweden, Jan. 9, 1980, 8000159
Int. Cl.³ F28D 9/02; F28F 3/04
U.S. Cl. 165—167 13 Claims



1. A plate heat exchanger comprising a plurality of generally rectangular plates arranged adjacent to each other and provided with turbulence-generating corrugations, said plates enclosing sealed heat exchanging passages for receiving two heat exchanging media flowing therethrough in mutually inclined main flow directions, the heat exchanger being characterized in that said corrugations extend in such directions that they form on an average a wider angle with the main flow direction of one of said media than with that of the other medium, whereby the passages for the two media provide different respective flow resistances.

4,376,461

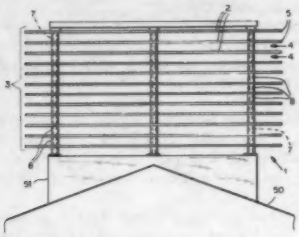
HEAT-PUMP HEATING UNIT

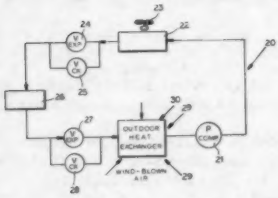
Bernd Dietrich, Heiligenhaus, and Wolfgang Kimpenhaus, Mettmann, both of Fed. Rep. of Germany, assignors to Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,533
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945052
Int. Cl.³ F28F 3/14; F25B 39/04
U.S. Cl. 165—170 3 Claims

1. A building-interior heating system comprising a heat pump connected to heat the interior of a building and having a heat pump fluid for the transfer of heat and a static heat exchanger traversed by said fluid, said heat exchanger comprising a multiplicity of geometrically similar, planar, vertically

spaced, horizontal heat exchange elements traversed by said fluid, means for connecting said elements together in a parallelopipedal stack with vertical sides at all of which gaps between the vertically spaced elements open freely onto wind-blown air, and means for mounting said stack externally of said





building for uniform through-flow of wind-blown air from any compass direction freely through said sides of said stack wherein said elements are plates being free at said sides and secured in said stack by traction bolts and spacers, said heat exchanger being devoid of any air propelling fan means and relying entirely upon wind-blown air.

4,376,462

SUBSTANTIALLY SELF-POWERED METHOD AND APPARATUS FOR RECOVERING HYDROCARBONS FROM HYDROCARBON-CONTAINING SOLID HYDRATES

Guy R. B. Elliott, Los Alamos; Bruce L. Barraclough, Santa Fe, and Nicholas E. Vanderborgh, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 19, 1981, Ser. No. 235,775

Int. Cl.³ E21B *36/00, 43/26, 43/38*

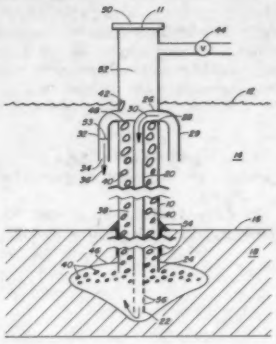
U.S. Cl. 166—267 **13 Claims**

1. A substantially self-powered method of recovering at least gaseous hydrocarbons from a formation comprising solid hydrocarbon hydrates, said method comprising:

(a) inserting at least two conduit means at least into said formation, such that brine can flow between a first conduit means and at least a second conduit means;

(b) starting a flow of relatively warm brine brought down from an upper level relative to said hydrates through said first conduit means by applying an external applied pressure source to said first conduit means or said second conduit means;

(c) discontinuing said applied pressure source and allowing said relatively warm brine to contact and melt said hydrates, wherein said brine moves after startup due to a difference in the hydrostatic pressure in said first conduit means containing essentially bubble-free brine and the hydrostatic pressure in said second conduit means containing at least both upwardly moving spent brine and bubbles of gaseous hydrocarbons produced when said hydrates melt; and



(d) separating said produced gaseous hydrocarbons from said spent brine.

4,376,463

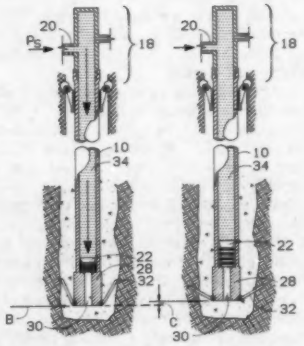
METHOD OF APPLYING TENSILE STRESS TO A CASING

Phillip D. Pattillo, Tulsa, Okla., and William H. Wadlington, Barrington, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 151,211, May 19, 1980, abandoned, which is a continuation of Ser. No. 964,859, Nov. 30, 1978, abandoned. This application Aug. 17, 1981, Ser. No. 293,754

Int. Cl.³ E21B *33/14, 33/16*

U.S. Cl. 166—285 **5 Claims**



1. A method of setting a string of casing in a wellbore comprising:

(a) suspending the string of casing in the wellbore,

(b) placing cement in at least a part of the annulus between the string of casing and the wall of the wellbore thereby surrounding a portion of the casing with cement,

(c) longitudinally elongating the string of casing in a downward direction causing elongation of the said portion of casing, and

(d) maintaining prior to the setting of said cement the longitudinal elongation of the portion of the string of casing surrounded by said cement.

4,376,464

WELL SAFETY VALVE

Robert W. Crow, Irving, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 8, 1980, Ser. No. 214,041
Int. Cl.³ E21B 34/10
U.S. Cl. 166—324 4 Claims

1. A surface controlled subsurface safety valve adapted to be placed in a well tubing string to control flow therethrough, comprising:

a tubular housing, having a bore therethrough;

a valve closure member in the housing bore movable between an open and a closed position;

a longitudinally movable, segmented operator tube disposed in the housing bore for controlling movement of the valve closure member;

pressure responsive means for moving said operator tube in a first direction, tending to open said valve closure member;

first resilient urging means for moving said operator tube in a direction opposite said first direction;

second resilient urging means engaging at least two segments of said segmented operator tube, constructed to permit telescoping of said two segments upon application of a predetermined force less than a force sufficient to cause damage to said valve closure member, but said second resilient urging means having sufficient force to maintain said segmented sections fully extended when less than said predetermined force is applied thereto;

wiper means between said segments of said operator tube and said operator tube and housing; and

equalizing means, operably engageable with said operator tube, including:

a housing, having a passageway therethrough extending parallel to said tubular housing bore,

a piston rod, received in said passageway, one end of which is wipingly engaged in said passageway and the other end thereof forming a valve member exposed to well fluid pressure, said valve member being reciprocally movable to a first position denying passage of well fluid pressure thereby and a second position in response to abutting engagement with said operator tube permitting passage of well fluid pressure thereby, and

means for conducting well fluid pressure bypassing said valve member to said bore of said safety valve tubular housing in order to reduce the well fluid pressure differential that may exist across said valve closure member;

said several wiper means inhibiting engagement of solid matter with said pressure responsive member while permitting pressure below the valve closure member to be effective on the pressure responsive member.

4,376,465

SPRINKLER HEAD

John R. Simons, Delavan, and John W. Fenske, Wauwatosa, both of Wis., assignors to Grunau Company Co., Milwaukee, Wis.

Continuation-in-part of Ser. No. 561,982, Mar. 25, 1975, abandoned. This application Jan. 19, 1976, Ser. No. 649,928
Int. Cl.³ A62C 37/08
U.S. Cl. 169—39 14 Claims

1. In a sprinkler having a frame with first and second ends, an orifice for discharging fluid at the first end of the frame, and a cap over the orifice for normally preventing discharge of fluid from the orifice, a structure positioned between the cap and the second end of the frame for releasably retaining the cap over the orifice, which structure comprises:

a first member engaging the cap,

a second member engaging the second end of the frame,

the first and second members being pivotally engaged and having adjacent portions tending to move away from each other in response to compressive force applied to the structure between the cap and the second end of the frame,

a pair of arms affixed to and extending in spaced relation away from one of the first and second members in the direction of the other of the first and second members and straddling the adjacent portion of the other of the first and second members,

a tubular retainer normally held between the pair of arms and engaging the straddled member,

eutectic means within the tubular retainer, and

arm-engaging means projecting from the tubular retainer and normally engaging one of the pair of arms to normally hold the tubular retainer in position to engage the straddled member but responsive to melting of the eutectic means to move inwardly in the tubular retainer, permitting the retainer to be released from the pair of arms and allowing the straddled member to move away from the adjacent portion of the other member and release the cap from its position over the orifice.

4,376,466

FIRE EXTINGUISHING APPARATUS FOR AIRDROPPING A FIRE-EXTINGUISHING AGENT

Hidetada Hara, Yokohama, Japan, assignor to Takashima & Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 250,078
Int. Cl.³ A62C 25/00
U.S. Cl. 169—53 5 Claims

1. A fire extinguishing apparatus for airdropping a fire-extinguishing agent, comprising:

a tank made of a flexible material and containing said fire-extinguishing agent;

a means including a valve for airdropping the fire-extinguishing agent in said tank;

a means holding the upper end of said tank to suspend said tank;

a support; the lower and upper ends of said support being

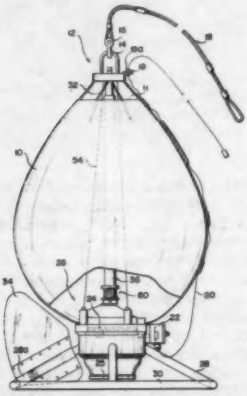
coupled with said airdropping means and said suspending means, respectively; and

a coupling mechanism for removably attaching the lower end of said support to said airdropping means,

said coupling mechanism including:

a bayonet-type upper coupling member attached to the lower end of said support and having a plurality of tooth portions protruding from the outer circumference thereof and groove portions formed between said tooth portions;

a bayonet-type lower coupling member attached to the upper portion of said airdropping means and having a plurality of tooth portions protruding from the inner circumference thereof and groove portions formed between said tooth portions;



a flange fixed around said support at the upper portion of said upper coupling member;

a coupling retaining member having a plurality of pawl portions and fitted in said support under said flange and extending downward along the axial direction, said coupling retaining member being able to slide vertically along said support; and

an elastic means disposed between said flange and said coupling retaining member, whereby said coupling retaining member is urged to move downward along said support,

the pawl portions of said coupling retaining member entering the overlapping groove portions of said upper and lower coupling members to maintain the coupling between said two coupling members when said coupling members are coupled.

4,376,467

SEAFLOOR DIVERTER

Neil W. Allen, Powell, Wyo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

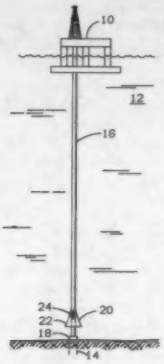
Division of Ser. No. 956,320, Oct. 31, 1978, Pat. No. 4,220,207. This application Jun. 9, 1980, Ser. No. 157,608

Int. Cl.³ C21B 7//128

U.S. Cl. 175—7 **4 Claims**

1. In a method of drilling a well in the ocean floor from a floating vessel using a drill string in a marine riser pipe wherein drilling fluid is circulated down said drill string and back up to the annulus between the riser pipe and drill string, the returning drilling fluids and cuttings being heavier than sea water, the improvement comprising:

forming, while circulating drilling fluid, a channel unobstructed for fluid flow in either direction from said annu-



lus through a port in the lower portion of said riser pipe to a level in said ocean below said port.

4,376,468

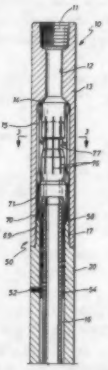
DRILLING JAR

George M. Clark, 5112 Steadmont, Houston, Tex. 77040

Filed Jan. 12, 1981, Ser. No. 224,152

Int. Cl.³ E21B 31/07

U.S. Cl. 175—304 **13 Claims**



1. A drilling jar for use with a drill string to assist in unsticking the drill string, comprising:

(a) upper and lower hollow mandrels having at least portions thereof in telescoping relation one within the other for relative linear telescoping movement, said mandrels each being adapted for connection to drill pipe of said drill string and forming cooperative abutment means for force transmission from one of said mandrels to the other, said upper and lower mandrels further cooperating to define wall means forming a detent release receptacle;

(b) an upper stinger pipe axially communicated with said lower mandrel and telescoped in said upper mandrel;

(c) radially yieldable detent means being positioned within said detent release receptacle and defining detent means, said detent means defining cam surface means;

(d) a detent engaging head positioned at an upper extremity of said stinger pipe defining cam means for actuating engagement with said cam surface means of said detent

means, said detent means yielding radially upon application of a predetermined linear force to said mandrels in response to camming actuation of said detent means by said detent engaging head and releasing said upper and lower mandrels and causing said abutment means to be brought into force transmitting slamming engagement at a force corresponding with said linear force; and

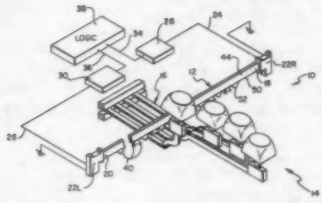
(e) a lock and release mechanism for selectively locking the drilling jar in a drilling position or releasing the drilling jar to impart a jarring impact to the drill string.

4,376,469

STEPPED ACOUSTIC TRANSPORT MEMBER

Scott J. Longrod, Danbury, Conn., assignor to SCM Corporation, New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,818
Int. Cl.³ B41J 5/08
U.S. Cl. 181—142 **11 Claims**



1. An acoustic transport member for use in a keyboard, the member serving to transport acoustic energy in the form of propagating sound waves and the keyboard having a plurality of key means, and a plurality of key-actuated strikers, each one of the key means operable to actuate selectably a related one of the strikers, the member receiving a sound-inducing impact in response to actuation of the selected striker, and the induced sound waves which propagate through the member being subject to dispersion of the waves an amount determined by contactable surfaces of the member and their orientation relationship relative to an intended plane of movement for the propagating sound waves provided by the member, the improved acoustic transport member comprises:

a one-piece construction member;

a first portion of the member providing discrete non-vibrating impact positions aligned with related strikers for receipt of the sound-inducing impact; and a second portion of the member continuosly joined to each one of said impact positions for receiving sound waves from said first portion, said second portion having sound wave reflecting boundaries defining a continuous corridor for establishing an uninterrupted path of movement for the received sound waves to propagate therethrough in substantial isolation from said impact positions of said first portion other than the impact position aligned with the selected striker thereby minimizing dispersion of the propagating sound waves.

4,376,470

FIBERGLASS LADDER

Larry J. Ashton, Mapleton, Utah, assignor to Little Giant Industries, Inc., American Fork, Utah

Filed Nov. 7, 1980, Ser. No. 204,746
Int. Cl.³ E06C 1/18, 1/32, 7/08
U.S. Cl. 182—23 **12 Claims**

1. A ladder comprising:

at least one pair of side rails, each of said side rails being molded from a composite material comprising bias wound fibers coated with resin wherein the fibers are angularly oriented with respect to a longitudinal axis of said respective side rail; and

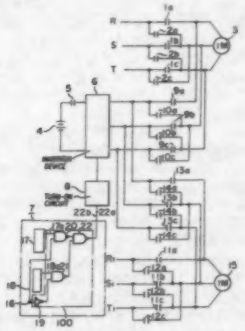
a plurality of rungs which are joined at the ends thereof to the side rails of each pair of side rails.

4,376,471

EMERGENCY APPARATUS FOR ELEVATOR

Hideo Uchino; Masami Nomura; Takaaki Aoi, and Masumi Kanbe, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1981, Ser. No. 226,906
Claims priority, application Japan, Jan. 21, 1980, 55-6093
Int. Cl.³ B66B 5/00; H02J 9/04
U.S. Cl. 187—29 R **5 Claims**



1. In an emergency apparatus for operating an elevator which converts a DC power into an AC power by an inverter device in an emergency state to feed the AC power to an AC traction motor and AC motor for door-opening and closing with each of said motors having different rated voltages so as to drive a cage of the elevator and to open and close a door of the cage, an improvement which comprises:

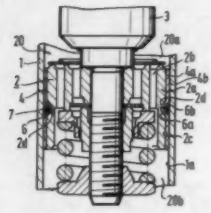
means for selectively feeding a power through said inverter device to either of said traction motor or said motor for door-opening and closing, in an emergency state; and

an oscillation circuit for varying the frequency of the output of said inverter device in the feeding of the AC power.

4,376,472
CYLINDER PISTON DEVICE

Günter Heyer, Schweinfurt; Günther Handke, Euerbach, and Joachim Kopic, Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel and Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,140
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008708
Int. Cl.³ F16F *9/32*
U.S. Cl. 188—322.22 **26 Claims**



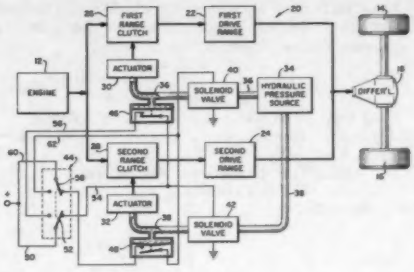
1. A cylinder piston device comprising:
(1) a cylinder member (1) having an axis and two ends and defining a cavity (20) therein;
(2) a piston rod unit with a piston rod member (3) axially movable with respect to said cylinder member (1), a portion of said piston rod member (3) being housed within said cavity (20);
(3) a piston unit (2) being fixed to said portion of said piston rod member (3) within said cavity (20);
3.1 said piston unit (2) defining two working chambers (20*a*, 20*b*) within said cavity (20);
3.2 said working chambers (20*a*, 20*b*) being interconnected by throttled fluid connection means (2*b*);
3.3 said piston unit (2) being provided with a piston ring supporting face (2*c*) which is directed substantially in a radial outward direction towards an inner circumferential surface (1*a*) of said cylinder member (1);
3.4 a piston ring member (4) with a radially inner circumferential face (4*a*) and a radially outer circumferential face (4*b*) being supported by its radially inner circumferential face (4*a*) on said piston ring supporting face (2*c*), and engaging by its radially outer circumferential face (4*b*) said inner circumferential surface (1*a*) of said cylinder member (1);
3.5 said piston ring member (4) being axially fixed with respect to said piston unit (2);
(4) a fluid being contained within said cavity (20); the improvement which consists in that said piston ring member (4) is provided with at least one radially inward directed projection (6*a*) extending in radially inward direction beyond said radially inner circumferential face (4*a*) of said piston ring member (4), said projection (6*a*) axially engaging a securing face (2*d*) of said piston unit (2) extending radially inward of said piston ring supporting face (2*c*), and said projection (6*a*) is defined by a radially inward directed depression (6) of said piston ring member (4).

4,376,473
MULTIPLE CLUTCH CONTROL SYSTEM

Donald J. Tomasek, Downers Grove, and Benjamin L. McCash, Burr Ridge, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Mar. 26, 1981, Ser. No. 247,704
Int. Cl.³ F16D *25/10*
U.S. Cl. 192—3.58 **15 Claims**

1. In a rotary power transmission of the type having a plurality of gears and first and second clutches cooperating with said gears for selectively shifting the transmission from a first gear ratio to a second gear ratio by engaging the first clutch while substantially disengaging the second clutch, the improvement of first and second clutch actuators for the respective clutches and control means comprising plural switches connected to activate and deactivate the first and second actuators for the first and second clutches, respectively,

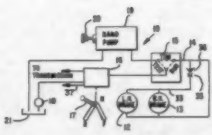


said control means effectively switching to make the shift selection and said plural switches including clutch pressure switch means responsive to said first clutch for preventing the disengagement of said second clutch until said first clutch is substantially engaged.

4,376,474
AUTOMATIC BRAKE SPEED BLEED SYSTEM

James H. Tunnell, Washington, and Hugh V. Piper, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01300, § 371 Date Oct. 1, 1980, § 102(e) Date Oct. 1, 1980, PCT Pub. No. WO82/01169, PCT Pub. Date Apr. 15, 1982
PCT Filed Oct. 1, 1980, Ser. No. 251,524
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **14 Claims**



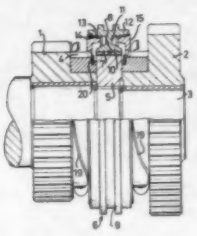
1. In a vehicle having a transmission, means (16) for disposing the transmission selectively in driving and neutral modes, and a hydraulic brake (12,13) and means operatively connecting the brake to the transmission for releasing the brake as an incident of the transmission being placed in driving mode, the improvement comprising
means (14,15,16,18,24,27,33,35,36) including first conduit means connected to an upper portion of the brake and second conduit means connected to a lower portion of the brake, said first conduit means being provided with means for permitting flow therethrough only outwardly from said brake upper portion for bleeding air from said upper portion of the brake and flushing debris from the lower portion (22) of the brake in response to placing the transmission in the neutral mode.

4,376,475

SYNCHRONIZER FOR MOTOR VEHICLE GEARBOXES

Gregorz K. Janiszewski, Angered, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Dec. 16, 1980, Ser. No. 217,179
Claims priority, application Sweden, Dec. 20, 1979, 7910540
Int. Cl.³ F16D 23/06
U.S. Cl. 192—53 F 5 Claims



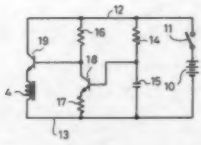
1. In a synchronizer formotor vehicle gearboxes for synchronizing the rotational speed of a gear provided with engaging teeth and rotatably mounted on a shaft and a shifting sleeve provided with corresponding engaging teeth and nonrotatably but axially displaceably mounted on the shaft, comprising a synchronizing ring arranged between the gear and the shifting sleeve, said ring having a radial web with internal teeth for engaging the engaging teeth of the gear and an axially directed flange extending from the web, the outer limiting surface of said flange forming a conical friction surface for engaging a corresponding internal frictional surface on the shifting sleeve, the synchronizing ring being loaded in the direction towards the shifting sleeve by spring means pressing against the ring; the improvement in which the axial flange of the synchronizing ring is directed towards the shifting sleeve, and the ring is symmetrically loaded by annular spring means arranged coaxially with the shaft and supported by the engaging teeth of the gear.

4,376,476

DRIVING CIRCUIT FOR MAGNETIC CLUTCHES FOR USE WITH REFRIGERANT COMPRESSORS

Tiichi Hagiri, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co. Ltd., Tokyo, Japan

Filed Jan. 29, 1981, Ser. No. 229,716
Claims priority, application Japan, Feb. 5, 1980, 55-12548
Int. Cl.³ F16D 27/00, 27/10; H01H 47/04
U.S. Cl. 192—84 R 5 Claims



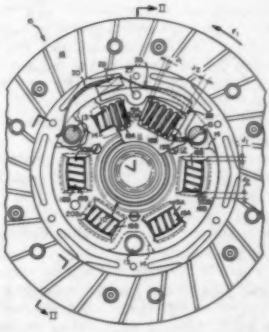
1. A driving circuit for a magnetic clutch adapted for use with a refrigerant compressor, the magnetic clutch being of the type including a clutch plate arranged close to a driving member and fixed to a main shaft provided in said refrigerant compressor, and a magnetic coil operable upon energization thereof to cause frictional engagement of said clutch plate with said driving member, said driving circuit comprising: a starting switch connected to a power source; a series circuit comprising a resistance and a capacitor and having a predetermined time constant, said resistance and capacitor being arranged to be energized upon closing of said starting switch; a first transistor having a base thereof connected to the junction of said resistance with said capacitor, for conduction responsive to an output from said series circuit; a second transistor having a base thereof connected to said first transistor for causing energization of said magnetic coil in response to the conduction state of said first transistor; and a limiting circuit connected to said first transistor and second transistor for limiting the excitation of said magnetic coil through said second transistor in response to the conduction state of said first transistor; wherein said magnetic coil is excited to an extent sufficient to cause engagement of said magnetic clutch during charging of said capacitor of said series circuit after closing of said starting switch, and is excited to a lesser extent but sufficient to maintain the engagement of said magnetic clutch after saturation of said capacitor.

4,376,477

TORSION DAMPING DEVICE PARTICULARLY CLUTCH FRICTION MORE ESPECIALLY FOR MOTOR VEHICLE

Pierre Loizeau, Ville d'Avray, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 21, 1980, Ser. No. 123,458
Claims priority, application France, Feb. 23, 1979, 79 04719
Int. Cl.³ F16D 3/66
U.S. Cl. 192—106.2 28 Claims

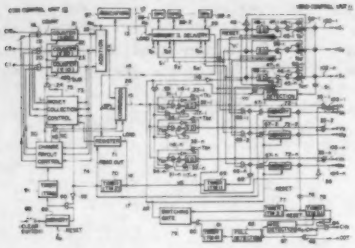


1. A torsion damping assembly of the type including at least two coaxial parts mounted for relative angular movement within predetermined limits of angular displacement, circumferentially acting resilient elements opposing said relative angular movement over at least a range of said angular displacement, the improvement comprising at least one intervening means responsive to centrifugal force for movement between a standby position and an operative position above a predetermined speed of rotation, return means urging said intervening means from said operative position back toward said standby position, said intervening means effectively circumferentially bearing against one of said coaxial parts to define a circumferential abutment for one of said resilient elements in said operative position for modifying the operational characteristics of said torsion damping assembly.

4,376,478
CONTROL DEVICE FOR A VENDING MACHINE INCLUDING SYSTEM FOR CONFIRMING VENDIBILITY OF SELECTED ARTICLES

Osamu Sugimoto, and Masaki Akagawa, both of Sakado, Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 196,073
Claims priority, application Japan, Oct. 16, 1979, 54/133311
Int. Cl.³ G07F 5/16
U.S. Cl. 194—1 N 9 Claims



1. A control device for a vending machine comprising counter means for adding amounts of deposited coins together and subtracting a price of an article to be vended and an amount of paid out coins from a total amount of the deposited coins, comparator means for comparing present contents of said counter means with a set vend price of an article, vend price setting means for presetting vend prices of respective articles, article selection switches corresponding to the respective articles and vend circuits corresponding to the respective articles for dispensing the articles in response to a vend drive signal characterized in that said control device further comprises vend control means which comprises:

vend price signal delivery means which delivers signals representing the set vend prices of all articles having been set by said vend price setting means to said comparator means during a first operation and delivers only a signal representing the vend price of the single article selected by said article selection switch during a second operation;

vend possible signal delivery means which delivers out, during said first operation, one or more vend possible signals corresponding to one or more vendible articles which have been detected by said comparator means;

vend drive signal delivery means which supplies, during said second operation, a vend drive signal corresponding to the single article which has been found vendible by said comparator means to said vend circuits; and

operation control means which judges whether said first operation is to be made or said second operation is to be made, causing said first operation and said second operation to be performed sequentially, and controls said respective signal delivery means in accordance with the judgement;

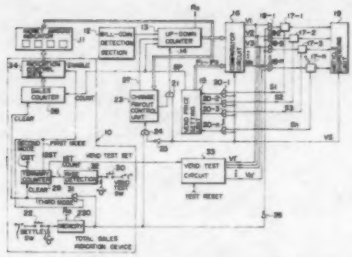
the operation of said article selection switch or switches being made effective by said vend possible signals and the article being dispensed by said vend drive signal.

4,376,479
TOTAL SALES INDICATION DEVICE FOR A VENDING MACHINE

Osamu Sugimoto, and Masaki Akagawa, both of Sakado, Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,874
Claims priority, application Japan, Oct. 16, 1979, 54-143024[U]
Int. Cl.³ G07F 9/00
U.S. Cl. 194—1 N 9 Claims

1. A total sales indication device for a vending machine which includes a money amount indicator for indicating the amount of deposited coins or a balance of such amount, sales counting means for computing the total sales of articles sold by the vending machine and indicator mode control switch means for controlling the indicator mode characterized in that the number of digits in decimal notation of the counting contents of said sales counting means is larger than the number of digits in decimal notation of the indication by said money amount

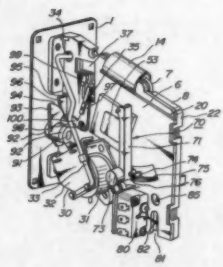


indicator and that said total sales indication device further comprises control means for dividing the digits of the total sales number computed by said sales counting means into a plurality of portions each of which consists of digits the number of which is equal to or smaller than the number of digits of the indication by said money amount indicator, and for causing said money amount indicator to sequentially indicate the digits of the respective portions, in response to manipulation of said indication mode control switch means.

4,376,480
COIN SORTING DEVICE

Hiroshi Abe, Kodaira, Japan, assignor to Asahi Seiko Co., Ltd., Tokyo, Japan

PCT No. PCT/JP80/00110, § 371 Date Jan. 25, 1981, § 102(e) Date Jan. 22, 1981, PCT Pub. No. WO80/02763, PCT Pub. Date Dec. 11, 1980
PCT Filed May 23, 1980, Ser. No. 233,583
Claims priority, application Japan, May 25, 1979, 54-65356; Nov. 10, 1979, 54-156827
Int. Cl.³ G07F 3/02
U.S. Cl. 194—101 4 Claims



1. A coin sorting device comprising:

a front plate provided with a coin inserting opening, an outside returning lever and a return opening;

a stationary side plate fixed to the back surface of said front plate;

a movable side plate openably connected at the upper side thereof to and spaced sidewardly from said stationary side plate to define a coin sorting passage;

a chute side plate secured to the back surface of said front plate and fixed to and spaced sidewardly from said station-

ary side plate to define a coin acceptance chute and a return chute therebetween;

a cradle pivoted to said movable side plate at an obliquely downward position from said inserting opening so as to receive coins inserted from said inserting opening;

an inclined track on said stationary side plate for rolling the coin free of said cradle thereonto;

a quality sorting means arranged in said stationary side plate and said movable side plate;

means arranged at a branching point from said coin sorting passage to said coin acceptance chute and said return chute for preventing non-acceptable coins from passing into said coin acceptance chute;

an L-shaped energy absorbing lever pivoted at the center thereof to said stationary side plate and having an upper arm extended into said coin sorting passage at the opposite side position of said coin inserting opening for engaging the outer periphery of the coin inserted from said coin inserting opening in the horizontal direction.

4,376,481

DEVICE FOR ARRANGING IN ORDER A RANDOM SUPPLY OF ARTICLES

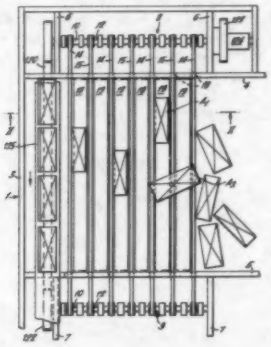
Kenneth W. Franklin, Fenny Compton, England, assignor to Wentcroft Engineers Limited, Southam, England

Filed Mar. 18, 1980, Ser. No. 131,500

Claims priority, application United Kingdom, Mar. 20, 1979, 7909769

Int. Cl.³ B65G 47/24, 47/38

U.S. Cl. 198—382 5 Claims



1. A device for arranging in order a random supply of articles comprising a plurality of spaced apart elongate article orientating blades, mounting means for said blades, drive means for driving the mounting means so that the blades move in a rotary path in the respective planes of the blades with each said blade having a parallel motion relative to said mounting means, an article engaging upper surface on each blade which during the rotary path of movement moves in an opposite longitudinal direction to the upper surface of an adjacent said blade so as to impart a turning movement to any article resting on the adjacent upper surfaces thereby orientating the article to enable it to be received between the blades, and means adjacent the blades for receiving the articles orientated by the blades including surfaces arranged in the space between adjacent blades and on which the articles rest in the desired orientation.

4,376,482

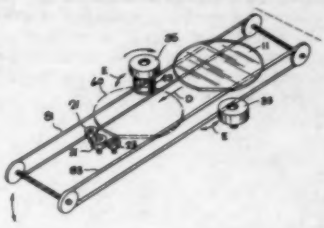
WAFER ORIENTATION SYSTEM

William R. Wheeler, Saratoga; George J. Kren, Los Altos, and David D. Clementson, Palo ALto, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed May 19, 1981, Ser. No. 265,412

Int. Cl.³ B65G 47/24

U.S. Cl. 198—394 9 Claims



1. Apparatus for orienting a wafer or the like having a primary flat registration edge along the wafer circumference comprising,

a plurality of rollers spaced about the circumferential edge of a wafer and in friction contact therewith, with a first and second of said rollers spaced apart a distance less than the dimension of a primary flat registration edge, said first and second rollers inwardly biased against the wafer edge, and a third roller, powered by a motor, causing wafer rotation,

means for sensing significant radial displacement of the first and second rollers upon rotation of the wafer, said displacement indicating contact with a flat registration edge, and

means for stopping wafer rotation upon sensing of significant radial displacement of the first and second rollers, thereby orienting a wafer with the registration edge in contact with the first and second rollers.

4,376,483

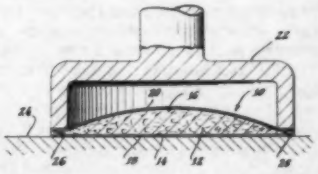
DEVICE FOR HOLDING AND DISPENSING A FLUID SUBSTANCE AND METHOD FOR MAKING SAME

William E. Sullivan, Blythewood, S.C., assignor to Risdon Enterprises, Inc, Columbia, S.C.

Continuation-in-part of Ser. No. 79,972, Sep. 28, 1979, abandoned. This application Dec. 31, 1980, Ser. No. 221,414

Int. Cl.³ B65D 73/00

U.S. Cl. 206—484 4 Claims



1. A device for holding and dispensing a substance such as a liquid, paste or the like, comprising:

a layer of a compressible, heat-sealable reservoir material, capable of holding said substance, having two principal surfaces and having a heat sealing temperature;

a first sheet of heat-sealable cover material disposed in close proximity to one of said principal surfaces of said layer;

a second sheet of heat-sealable cover material disposed in close proximity to the other of said principal surfaces of said layer, said cover materials being substantially impermeable to said substance, said cover material of which at

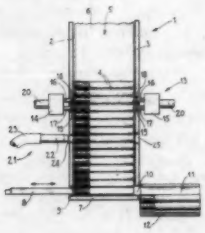
least one of said sheets is made being different from and having a heat-sealing temperature that is greater than the heat-sealing temperature of said reservoir material, said sheets and said layer being compressed together at a continuous boundary at a temperature greater than the heat-sealing temperature of said reservoir material but less than the heat-sealing temperature of said cover material of which said one sheet is made, whereby said reservoir material is compressed and fused at said boundary to prevent lateral absorption of said substance therepast and said one sheet is lightly joined but not heat-sealed to said layer at said boundary, whereby said one sheet may be removed from said layer by applying a shear force thereto relative to said layer.

4,376,484

DEVICE FOR CHECKING THE SOUNDNESS OF THE CIGARETTES IN A PACKETING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Mar. 20, 1981, Ser. No. 245,955
Claims priority, application Italy, Apr. 1, 1980, 3369 A/80
Int. Cl.³ B07C 5/00; A24C 5/345
U.S. Cl. 209—535 8 Claims



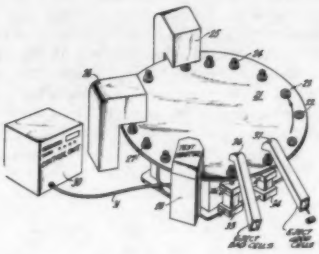
1. A device for checking the soundness of cigarettes fed to a cigarette packeting machine, a cigarette infeed hopper for said packeting machine, means to feed said cigarettes through said hopper in steps of one cigarette at a time in single file transversely to their axes, means to mount said checking device on said hopper, said checking device comprising a plurality of N in number of cigarette soundness sensor means, and cigarette ejector means all arranged closely adjacent the ends of said cigarettes as they move through said hopper and in predetermined spaced relation to each other with said ejector means downstream of all of said sensor mens, all N of said sensor means each performing a checking operation on each single cigarette step motion of said cigarettes through said hopper, means to coordinate the operations of all N of said sensor means and said ejector means together with the operation of said means to feed said cigarettes through said hopper to eject a faulty cigarette sensed by any one of said N number of sensor means by said ejector means, and said N number of sensor means being operative to detect and to cause said ejector means to eject (N−1) faulty cigarettes in succession and also to assure that every cigarette in said hopper will be checked as to soundness at least once.

4,376,485

METHOD FOR RAPIDLY TESTING QUALITY OF INCOMPLETELY CHARGED ELECTROCHEMICAL CELLS

Rameschandra V. Shah, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 63,433, Aug. 3, 1979, abandoned, which is a continuation of Ser. No. 812,727, Jul. 5, 1977, abandoned.
This application Nov. 12, 1980, Ser. No. 205,908
Int. Cl.³ B07C 5/344
U.S. Cl. 209—575 28 Claims



1. A method for rapidly testing rechargeable electrochemical cells for defects following assembly while the cells are in a substantially uncharged condition, comprising:

applying a current to the uncharged electrodes via the positive and negative terminals of the assembled cell under test, said current substantially having a magnitude greater than the one-hour current capacity of the cell and applied for a duration sufficient to develop an increased voltage between the cell terminals but insufficient to sustain the attained voltage upon removal of such current;

measuring the charge voltage so developed during application of said current at said magnitude and while the electrodes of the cell are incompletely charged; and

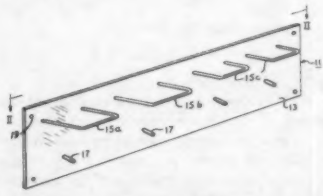
thereafter terminating said current so that the total charge applied to the cell does not exceed about one percent (1%) of the cell's fully charged capacity.

4,376,486

SHOE LAST RACK

Paul J. Arcadi, Jr., 1355 45th St., Sarasota, Fla. 33580

Filed Jan. 21, 1981, Ser. No. 226,747
Int. Cl.³ A47F 7/08
U.S. Cl. 211—35 5 Claims



1. A rack for holding shoe repair lasts used by a shoe repairman, said shoe repair lasts having each a socket and said rack comprising:

(a) a planar supporting member adapted for attachment to a shoe repairman's work bench in a substantially vertical position;

(b) a plurality of loop members each extending outwardly and substantially horizontally from a surface of said planar supporting member and affixed to said planar supporting member;

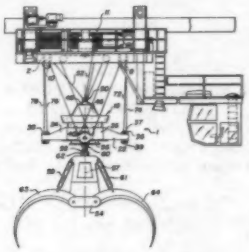
(c) a plurality of pins affixed to and projecting from said surface of the planar supporting member, each one of said pins being disposed at a downwardly directed slant angle below a corresponding one of said loop members in such a location that said socket in said shoe repair last engages over the pin and the loop member associated therewith peripherally engages said shoe repair last, whereby said last is supported by said co-operating pin and loop member in a substantially vertical position on said rack and in engagement with said surface.

4,376,487

ANTI-SWAY, ANTI-ROTATION MECHANISM FOR CRANE REEVING

Cornelius J. M. Van Soest; Rostislav Muller, and Stjepan Bagaric, all of Port Moody, Canada, assignors to Harnischfeger Corp. of Canada Ltd., Canada

Filed Jan. 22, 1981, Ser. No. 227,450
Int. Cl.³ B66C *13/06*
U.S. Cl. 212—147 **6 Claims**



1. An anti-sway, anti-rotation mechanism for reeving of a crane having an overhead support with a winding drum, the mechanism comprising:

four spaced-apart overhead sheaves on the overhead support, the winding drum being between two pairs of the overhead sheaves;

a lifting beam assembly with four pairs of lifting beam sheaves, the pairs of sheaves being spaced-apart from each other;

load carrying means connected to the lifting beam assembly; and

four cables comprising two pairs of adjacent cables extending downwardly from the winding drum, each cable extending downwardly and about one said lifting beam sheave of one said pair of lifting beam sheaves, then upwardly and about an overhead sheave, then downwardly and about another said lifting beam sheave of another pair of lifting beam sheaves adjacent said one pair of sheaves, then upwardly to an end of the cable adjacent the overhead support to prevent swaying and rotation of the lifting beam assembly during operation of the crane and to keep the lifting beam assembly level.

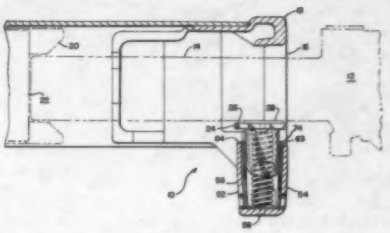
4,376,488

RAILWAY COUPLER CARRIER ASSEMBLY

Russell G. Altherr, Munster, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Continuation of Ser. No. 53,345, Jun. 29, 1979, abandoned. This application Sep. 8, 1980, Ser. No. 185,212
Int. Cl.³ B61G *9/22, 7/10*
U.S. Cl. 213—61 **2 Claims**

1. A railway coupler carrier assembly of the type having a spring basket defined by front and rear walls, two substantially opposing end walls and a bottom wall, said spring basket acting as a carrier pocket with a plurality of compression springs disposed therein; and a coupler carrier having an upper substantially horizontal plate portion for supporting a coupler, and a lower portion at least partially disposed in said spring basket, said coupler carrier being supported on said compression springs for vertical movement in said basket; a wear element including a front wall, a rear wall and a bottom wall and located so that said front, rear and bottom walls of said wear element are adjacent to at least a portion of said front, rear and bottom walls of said spring basket, respectively, said wear element acting to reduce contact between said spring basket and said coupler carrier as said spring basket and said coupler



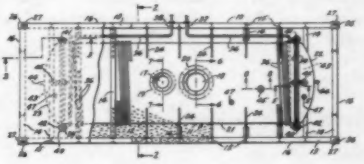
carrier move in relation to each other, said lower portion of said coupler carrier including two substantially opposing, laterally extending lugs each of which cooperate with a different end wall of said spring basket to restrain the movement of said spring basket relative to said coupler carrier, said wear element further including two lateral extensions each of which engage a different lug, said extensions being formed by two projections from said front wall of said wear element in engaging relationship with two projections from said rear wall of said wear element.

4,376,489

CONTAINER FOR HAZARDOUS MATERIAL

Richard E. Clemens, Medford, Mass., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 23, 1981, Ser. No. 237,029
Int. Cl.³ B65D *88/74;* F17C *1/12*
U.S. Cl. 220—1.5 **7 Claims**



1. A container for hazardous material comprising

(a) an outer shell,

(b) an inner cylindrical tank to be substantially filled with hazardous material,

(c) resilient filler material between the shell and the tank,

(d) a first flexible, impervious diaphragm member fixed within the tank and extending in a plane substantially transverse to the longitudinal axis of the tank to provide a first chamber adjacent one end of the tank free of hazardous material, and

(e) means to pressurize the chamber by admitting a gas thereto and thereby allow for the expansion, contraction and movement of the hazardous material by flexing of the diaphragm member.

4,376,490

OBSERVING WINDOW DEVICE FOR LIQUID TANKS

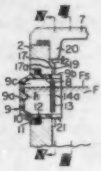
Yoshinobu Mizusaki, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Oct. 31, 1980, Ser. No. 202,464

Claims priority, application Japan, Nov. 10, 1979, 54-156045[U]; Nov. 19, 1979, 54-160043[U]; Dec. 19, 1979, 54-176036[U]; Mar. 18, 1980, 55-35584[U]

Int. Cl.³ B65D 25/54, 25/56; G01F 23/02

U.S. Cl. 220—82 R 10 Claims



1. An observation window device for a liquid tank having a window opening formed in a side wall thereof, said window device comprising a generally cup-shaped transparent pane member including a side wall having an outer periphery with an abutment flange therearound, said side wall of the cup-shaped member being provided with slit means, said pane member having an open end extending into the interior of said liquid tank and including an integral lower limit level indicating portion for defining the lowest level of liquid in said liquid tank, pane retainer plate means engaged in said slit means and held in abutting engagement with an inside surface of said side wall of said liquid tank for resiliently urging said pane member inwardly of said liquid tank to place said abutment flange in fluid-tight contact with an outside surface of said side wall of said liquid tank and rotation-restraining means integrally formed with said pane retainer plate means for holding said pane member and said pane retainer plate means in place against rotation thereof relative to said liquid tank, said slit means including a pair of slits in opposition in said side wall of said cup-shaped pane member, said pane retainer plate means comprising a retainer plate including a pair of spaced, parallel grip legs respectively in fitting engagement in said slits and a bridge portion interconnecting said grip legs at the top thereof, said tank having a removable cover member, said bridge portion of said pane retainer plate being held in abutting engagement with said cover member so that said retainer plate is prevented from inadvertent disengagement from said pane member.

4,376,491

FLEXIBLE MEMBRANE CONTAINER CLOSURE

Harold Banker, Jr., Turnersville, N.J., assignor to NER Data Products, Inc., Glassboro, N.J.

Filed Oct. 26, 1981, Ser. No. 314,571

Int. Cl.³ B65D 7/28, 6/40, 39/00

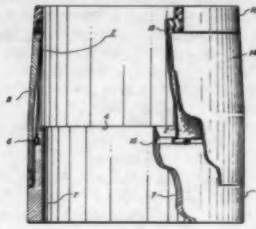
U.S. Cl. 220—200 8 Claims

1. Container closure apparatus comprising:

(a) a first closure body providing a discharge aperture of predetermined size;

(b) a second coacting closure body coaxially disposed about the outside periphery of the first closure body and adapted for relative bi-directional rotation with respect to the first closure body; and

(c) a cylindrically shaped, resilient, distortable membrane having a first terminal end fully affixed to the periphery of



the first closure body and a second terminal end fully affixed to the second closure body.

4,376,492

CLOSURE MEMBER FOR THE FUEL TANK OF AN AUTOMOTIVE VEHICLE

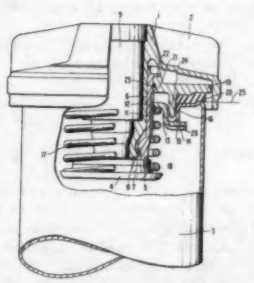
Günter Bartel; Horst Fiedler, both of Stuttgart; Manfred Stotz, Aichwald, and Einhard Kleinschmit, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz A.G., Stuttgart, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,438

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930133

Int. Cl.³ B65D 55/14

U.S. Cl. 220—210 23 Claims

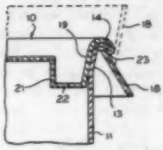


1. A closure mechanism for a tank, the mechanism comprising a cap housing, a locking tube associated with the cap housing so as to be rotatable relative thereto, a cap means disposed opposite the cap housing and associated with the locking tube, a pressure plate associated with the locking tube, means for selectively connecting the cap housing with the locking tube so as to enable the locking tube to rotate with the cap housing, and a clamping ring means associated with the locking tube so as to be rotatable therewith and to enable a locking and unlocking of the closure mechanism on a filler opening of the tank, characterized in that the locking tube and pressure plate are formed as two separate members, the pressure plate surrounds the locking tube and is mounted thereon with a sliding fit, and in that sealing means are provided for sealing separating surfaces between the locking tube and the pressure plate, said closure mechanism allowing said locking and unlocking on the filler opening of the tank without movement of said pressure plate with said locking tube being necessary.

4,376,493
LOCKABLE CLOSURE FOR CONTAINERS

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed Sep. 19, 1980, Ser. No. 188,806
Int. Cl.³ B65D 41/10, 41/12, 41/14
U.S. Cl. 220—307 12 Claims



1. A lockable closure for a container having a wall with a radially displaced downwardly extending annular lip, comprising:

an annular portion adapted to be disposed in contact with a portion of the annular lip of the container,

shoulder means adapted to pivot about the extended end of the annular lip of the container, said shoulder means being integral with and extending from said annular portion of said closure, said shoulder means being movable into and out of engagement with the extended end of the annular lip of the container, and

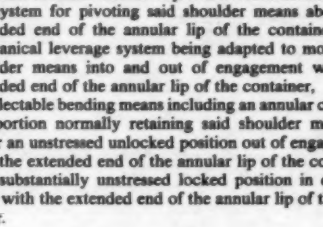
deflectable bending means integral with and extending from said shoulder means, said deflectable means cooperating with said shoulder means to provide a mechanical leverage system for pivoting said shoulder means about the extended end of the annular lip of the container, said mechanical leverage system being adapted to move said shoulder means into and out of engagement with the extended end of the annular lip of the container,

said deflectable bending means including an annular continuous portion normally retaining said shoulder means in either an unstressed unlocked position out of engagement with the extended end of the annular lip of the container or a substantially unstressed locked position in engagement with the extended end of the annular lip of the container.

4,376,494
INSULATED TANK CONTAINER

Anders Bjurling, Skultuna, Sweden, assignor to Dynatrans AB, Frolunda, Sweden

PCT No. PCT/SE80/00086, § 371 Date Nov. 26, 1980, § 102(e) Date Nov. 26, 1980, PCT Pub. No. WO80/02019, PCT Pub. Date Oct. 2, 1980
PCT Filed Mar. 26, 1980, Ser. No. 224,561
Claims priority, application Sweden, Mar. 28, 1979, 79027629
Int. Cl.³ B65D 90/04
U.S. Cl. 220—444 4 Claims

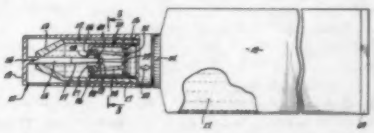


1. A light weight insulated tank container system for liquids comprising in combination, a rigid outer framework, a thin inner tank shell comprising a plurality of side by side tanks substantially rectangular in cross-section with outer walls curved outwardly, a foam plastic heat insulation layer outermost shell in contact with the curved surfaces of said outer walls to comprise an outermost surface layer of the container and thereby performing the principal load-bearing surface which has the capacity to take up and transfer stresses in various directions, the foam plastic layer being firmly affixed to and integrated with both the (a) thin inner tank shell to substantially cover the entire surface of the inner tank shell and form together therewith a load bearing unit taking up the forces from the liquid on the thin inner shell and (b) the rigid outer framework to bear the load and dampen blows from external forces, said insulation layer outermost shell being presented as the principal load bearing part over the container system adapted to bear loads.

4,376,495
DEVICE FOR ADJUSTING DOSE DISPENSED

Walter B. Spatz, 1141 Donaire Way, Pacific Palisades, Calif. 90272

Filed Jun. 1, 1981, Ser. No. 268,844
Int. Cl.³ B65D 35/30
U.S. Cl. 222—46 14 Claims



1. A dispensing apparatus for fluent material comprising a container member having a discharge opening, piston means shiftable axially in said member in sealing engagement therewith, said piston means having a passage through which the fluent material in said member can flow forwardly towards said opening, valve means for closing said passage, operating means movable through said opening for shifting said valve means from closed to open position and said piston means rearwardly in said container member to a preselected position, and means for closing said valve means upon withdrawal of said operating means from said opening, whereby the fluent material can be pressurized to shift said piston means towards said opening and fluent material forwardly of said piston means through said opening.

4,376,496
POST-MIX BEVERAGE DISPENSING SYSTEM SYRUP PACKAGE, VALVING SYSTEM, AND CARBONATOR THEREFOR

Jason K. Sedam, Dunwoody, Ga., and William R. Fuerst, Tucson, Ariz., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 84,434, Oct. 12, 1979, Pat. No. 4,306,667.
This application Aug. 24, 1981, Ser. No. 295,265
Int. Cl.³ B67B 7/24
U.S. Cl. 222—83.5 2 Claims

1. In a gravity flow post-mix beverage dispenser system including a sealed syrup package having a frangible opening through which said syrup may flow when said frangible opening is ruptured, a valve assembly in communication with said syrup package and a source of water, said valve assembly comprising:

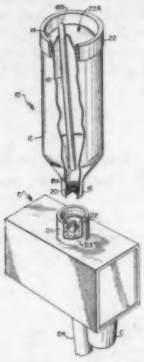
a valve body having substantially flat top, bottom and side walls, a pair of parallel bores disposed in common planes between and parallel to said top and bottom walls, at least one end of said bores extending through a common side wall of said valve body, each said bore having a valve seat therein which separates the bores into inlet and outlet chambers;

a valve element extending into each of said bores through said

common side wall, a sealing end of said valve element being operatively associated with said valve seat for opening or closing the fluid path between said inlet and outlet chambers and an opposite actuating end of said valve element extending through said common side wall;

a socket extending from the top wall of said valve body for receiving the portion of said syrup package having said frangible opening, said socket communicating with the inlet chamber of one of said parallel bores;

said source of water communicating with the inlet chamber of the other one of said bores;



piercing means associated with said socket for rupturing said frangible opening in said syrup package as said syrup package engages said socket;

a mixing nozzle extending from the bottom of said valve body in communication with said outlet chamber of said bores for dispensing a mixture of water and syrup; and

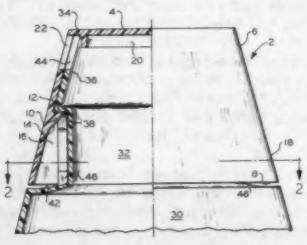
means for simultaneously engaging the respective ends of said valve elements passing through said common side wall, to permit the simultaneous flow of syrup and water from the outlet chambers to said mixing nozzle.

4,376,497

CHILD RESISTANT DISPENSING CLOSURE

George V. Mumford, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 15, 1980, Ser. No. 187,300
Int. Cl.³ B67B *5/00*
U.S. Cl. 222—153 **3 Claims**



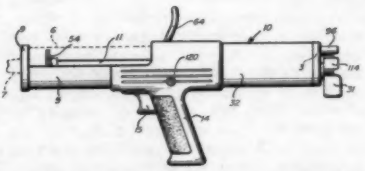
1. A child resistant package comprising, in combination, a container having an annular neck and a closure fitted on said neck, said container neck having a radially disposed discharge port and a downwardly facing shoulder, said closure comprising a panel section and an annular skirt depending from the periphery of said panel section molded from an elastomeric material, means on the skirt of said closure for engaging said shoulder to retain said closure on said neck against axial displacement but permitting rotational movement of said closure relative to said neck, said closure having a radial dispensing port formed in said annular skirt, a pair of diametrically opposed cooperating detent and notch means formed on the said annular skirt of the closure and on said container neck to secure said closure to said container neck in a position where said radial ports are mis-aligned, said annular skirt of said closure being radially deformable by manual application of a squeezing force intermediate said pair of detent and notch means to release said detent from said notch to permit rotational alignment of said closure dispensing port with said container neck dispensing port, an upwardly facing camming surface outwardly projecting from said neck, and a downwardly facing camming surface inwardly projecting from said skirt, said camming surface being engageable only when said elastomeric skirt is manually squeezed to move said downwardly facing camming surface radially inwardly, at least one of said camming surfaces having a generally helical shape, whereby rotation of said closure relative to said neck while said camming surfaces are engaged will cam said closure upwardly off said neck.

4,376,498

HAND-HELD PNEUMATIC CAULKING GUN

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Filed Oct. 2, 1980, Ser. No. 193,122
Int. Cl.³ B67D *5/46*
U.S. Cl. 222—326 **30 Claims**



1. A hand-held pneumatic caulking gun including in combination, a receptacle for receiving therein a caulk containing cartridge having a caulk dispensing nozzle thereon, a piston movable when driven from a retracted position to a forward position within said cartridge to force caulking from said nozzle, driving means for said piston including means for applying a continuous pneumatic pressure to a surface of said piston to cause movement of the piston through said cartridge to force caulking from said nozzle, manually releasable holding means for holding said piston against movement by said pneumatic pressure towards its forward position, piston release means manually operable to release the holding means from holding the piston, and valving means operable to redirect piston driving pneumatic pressure to return said piston to a retracted position.

4,376,499

CONTAINER WITH DISPENSING ELEMENT

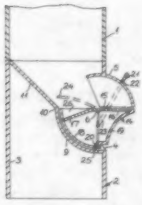
Steen Ostergaard, Gentofte, Denmark, assignor to Stig Ravn A/S, Farum, Denmark

Continuation of Ser. No. 45,875, Jun. 6, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,838
Claims priority, application Denmark, Jun. 7, 1978, 2537/78
Int. Cl.³ G01F *11/10*
U.S. Cl. 222—339 **2 Claims**

1. A container which is intended to store granular materials and which includes a dispensing element for discharging fixed quantities of the granular materials when manually operated said container including (a) a side wall which has a discharge opening therein, said discharge opening extend in a vertical direction when the container is positioned on a horizontal surface, the upper and lower ends of the discharge opening being semi-circular in shape, (b) an internal floor

formed by a lower part and an upper part, the lower part extending from the side wall adjacent the lower end of the discharge opening upwardly and inwardly into the container to an upper edge which lies in a horizontal plane that extends through a line located at about the middle of the discharge opening, the lower part having a circular arch-shaped cross-section (shaped as a part of a torus), the upper part extending upwardly from the upper edge of the lower part and merging with the container side wall, (c) an outer roof part which extends outwardly of the container side wall adjacent the edge of the upper end of the discharge opening and downwardly to a lower edge which lies in a horizontal plane which extends through a line located at about the middle of the discharge opening, the roof part having a circular arch-shaped cross-section (shaped as a part of a torus), and (d) an inner roof part which extends inwardly of the container side wall adjacent the edge of the upper portion of the elliptical dispensing opening and downwardly a short distance, the inner roof part also having a circular arch-shaped cross-section (shaped as a part of a torus),

a dispensing element positioned between the lower part of the internal floor of the container and the inner and outer roof parts, the dispensing element including (a) a plate part



which comprises a flat forward portion and a flat rearward portion, the flat rearward portion extending at a downward angle compared to the flat forward portion when the flat forward portion is horizontally oriented, (b) a skirt part which is connected to the plate part, the skirt part having a circular arch-shaped cross-section, the circular portion of the skirt part lying adjacent to and coincident with the lower part of the internal floor of the container when the flat forward portion of the plate part is horizontally oriented, (c) a concave wall part which connects the forward edge of the flat forward portion of the plate part and the nearest edge of the skirt part, and (d) a handle which extends from the concave wall part to a point outside the container side walls, the handle, when operated, being capable of pivoting the dispensing element to emit a fixed quantity of granular materials, the dispensing element being dimensioned such that when in its closed position the forward edge of the flat forward portion thereof will abut the lower edge of the outer roof part of the container and when in its fully open position the edge of the skirt part nearest the flat rearward portion will abut the inner edge of the inner roof part of the container, and

a spring means connected to the dispensing element to bias it into a non-dispensing position.

4,376,500

EXPANDABLE BAG

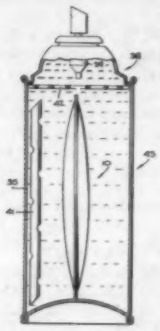
Russell Banks, Pawling, N.Y., and David J. Magid, Doylestown, Pa., assignors to Enviro-Spray Systems, Inc., Montgomeryville, Pa.

Filed Jul. 25, 1980, Ser. No. 172,357

Int. Cl.³ B67D *5/54*

U.S. Cl. 222—386.5 **13 Claims**

1. A fluid impervious expandable enclosed bag containing separately compartmented first and second gas generating components which, upon admixture in successive amounts, generate gas causing said bag to expand gradually from a collapsed condition to an ultimately fully expanded condition, said bag comprising a plurality of recesses disposed in the sidewall of said bag in serial alignment, said first component disposed in said recesses, a cover sheet enclosing said recesses, said cover sheet releasably adhered to the internal sidewall of said bag adjacent said recesses and permanently adhered to said internal sidewall opposite said recesses, said second component disposed within said bag separate from said recesses, separate container means disposed in said bag and a solvent



medium disposed therein, an additional quantity of said first component disposed within said bag separate from said recesses in time release condition, said separate container means rupturable to cause its contents to be discharged into the interior of said bag into admixture with said time release first component and said second component to initiate generation of said gas after a predetermined time interval, said cover sheet being successively releasable from said recesses upon expansion of said bag to discharge the first component therein into admixture with said solvent containing said second component to maintain generation of said gas and a relative constant pressure thereof until said bag reaches its fully expanded condition.

4,376,501

CLOSURE ELEMENT AND ASSEMBLY OF A SLIDE CLOSURE FOR USE IN LIQUID MELT CONTAINERS

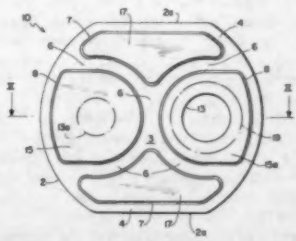
Alfred Hafner, Wädenswil, Switzerland, and Udo Muschner, Tönisvorst, Fed. Rep. of Germany, assignors to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Apr. 14, 1981, Ser. No. 254,149

Claims priority, application Switzerland, May 9, 1980, 3813/80

Int. Cl.³ B22D *37/00, 11/10*

U.S. Cl. 222—600 **29 Claims**



1. A closure element of a slide closure for use in liquid melt containers, said closure element comprising:

a refractory plate having a sliding surface, peripheral edges, and at least one flow passage extending through said refractory plate from said sliding surface to an opposite surface spaced therefrom;

a metallic sheath partially encompassing said refractory plate, said metallic sheath including an edge portion embracing said peripheral edges of said refractory plate about the entire periphery thereof and a bottom portion adjacent said opposite surface of said refractory plate;

said bottom portion of said metallic sheath having formed therein a plurality of openings exposing therethrough a plurality of surface areas of said opposite surface of said refractory plate, said openings including one said opening in the area of said flow passage, said plurality of openings being separated from each other and from said edge portion of said metallic sheath by a plurality of strips which thus form said bottom portion; and

at least some of said exposed surface areas being aligned relative to said sliding surface and forming means for engagement with a metal support frame for supporting said closure element.

4,376,502

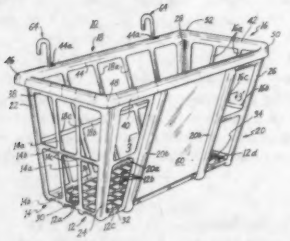
NESTABLE BASKET FOR USE WITH NESTABLE SHOPPING CARTS AND THE LIKE

Melvin Cohen, Franklin Lakes, N.J., assignor to Melrose Displays, Inc., Passaic, N.J.

Filed Sep. 17, 1981, Ser. No. 303,195

Int. Cl.³ B60R *9/00*

U.S. Cl. 224—42.43 **4 Claims**



1. A basket attachment for releasable mounting to shopping carts and the like comprising a one-piece basket structure formed of a plastic material and having continuous sidewalls joined at their lower ends to a floor;

each of said sidewalls and said floor having an open network configuration formed by first and second groups of transversely aligned ribs, said first ribs being integrally joined to said second ribs at their intersections;

said basket structure having an open upper end;

one wall of said basket structure having an open region defined by a pair of substantially vertically aligned ribs;

a substantially planar sheet arranged to receive advertising and/or message material on both the front and rear surfaces thereof;

said pair of ribs each having recess means for slidably receiving opposing edges of said sheet whereby said sheet fills the aforesaid open region between said pair of ribs;

the exterior surfaces of said pair of ribs extending outwardly and away from said wall to protect the sheet slidably received therebetween against damage;

an inclined ramp extending across the bottom marginal portion of said planar sheet for normally urging items placed in said basket attachment away from the interior surface of said planar sheet.

4,376,503

MAGNETIC TAPE TRANSDUCER APPARATUS DRIVE ARRANGEMENT

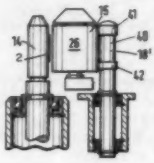
Heinrich Zahn, Rossdorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,374

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009644

Int. Cl.³ B65H *17/22*

U.S. Cl. 226—181 **6 Claims**



1. Drive arrangement for magnetic tape transducer apparatus having

a driven capstan (14);

means (12,13,16) guiding the tape over a circumferential portion of the capstan (14);

a pressure roller (15) in engagement with a tape (2) at the side opposite the capstan to press the tape against the capstan;

and resilient means (22,114,114'; 118) mounting the pressure roller to apply a resilient bias force against the tape

wherein, in accordance with the invention

the guide means guides the tape (2) tangent with respect to the capstan (14);

the resilient mounting means comprises a pivoted floating mounting element (22) supporting the pressure roller and so positioning the pressure roller that a line connecting the axis of the capstan (14) and the axis of the pressure roller (15) is perpendicular to the tangential engagement of the tape (2) with the captan;

resilient force means (114') are provided in force transmitting engagement with the pressure roller to press the pressure roller against the tape;

and comprising a freely rotatable support or counter roller (18), in surface engagement with the pressure roller (15) to provide a counter support for the pressure roller with respect to said resilient force means, the axis of rotation of the support or counter roller (18), the axis of rotation of the pressure roller (15) and the axis of rotation of the capstan (14) being positioned on the corners of a triangle.

4,376,504

MACHINE FOR ATTACHING BUTTONS HAVING SHANKS TO AN ARTICLE IN A CORRECTLY BUTTONED CONDITION

Herbert Birkhofer, Brunswick, Fed. Rep. of Germany, assignor to Firma Schaeffer-Homberg GmbH, Wuppertal, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,557

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939262

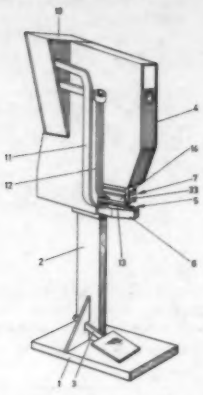
Int. Cl.³ A41H *37/10*

U.S. Cl. 227—32 **13 Claims**

1. In a machine for the attachment of buttons provided with shanks, respectively, to articles and having a lower tool which supports a button lower part and an upper tool which holds a button upper part in alignment with the button lower part, said upper tool being movable relative to the lower tool towards the lower part, the improvement comprising

means disposed in front of said upper tool for widening a buttonhole in a first layer of material to approximately a width of said shank to be seated through the widened

buttonhole onto an underlying layer of material to enable said button upper part and said button lower part to be



engaged and secured to said underlying layer in alignment with said buttonhole.

4,376,505

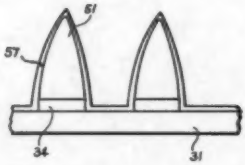
METHODS FOR APPLYING SOLDER TO AN ARTICLE

Thaddeus Wojcik, Hopewell Township, Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,439

Int. Cl.³ H01L *21/60*

U.S. Cl. 228—215 **3 Claims**



1. A method of forming a thick deposit of solder on an electrically conductive portion of a metallized substrate, the method comprising the steps of:

(a) forming a thick layer of cured solder paste on the conductive portion;

(b) applying a hard coating over said cured solder paste to confine the thick layer of cured solder paste;

(c) reflowing the solder, while confined, to bond the solder to the conductive portion; and

(d) removing the hard confining coating.

4,376,506

SEAM RELEASE STRIP COMPOSITE CONTAINER

Teddy M. Westphal, Glencoe, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Filed Jun. 4, 1981, Ser. No. 271,027

Int. Cl.³ B65D *3/14*

U.S. Cl. 229—5.6 **5 Claims**

1. A composite container for fluent materials in the liquid or semi-frozen state, comprising:

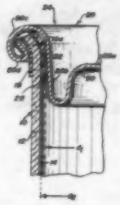
(a) a vertically arranged cylindrical body member including concentrically arranged fibrous body wall and fluid impervious inner liner layers, the upper end portion of said body member being flared radially outwardly approximately 15 to 30 degrees relative to the vertical terminating in a flared portion having a length of approximately one-sixteenth of an inch;

(b) an end closure member closing the upper end of said body member, said closure member including:

(1) a circular central panel portion arranged within and extending transversely across the upper end of said body member;

(2) an annular chuck wall portion extending upwardly from said central panel portion adjacent the outwardly flared portion of said body member; and

(3) an annular connecting flange portion extending radially outwardly from the upper end of said chuck wall portion, said connecting flange portion and said chuck wall portion cooperating with the inner surfaces of said body member flared portion and the adjacent portion of



said body member, respectively, to define an annular space;

(c) an annular mass of sealing material arranged in at least the upper portion of said annular space opposite said body member flared portion; and

(d) a seam release strip arranged circumferentially about the outer surface of the upper end portion of said body member;

(e) said connecting flange portion being inwardly crimped into connecting engagement with said body member and said seam release strip without substantial deformation of said body member, thereby causing said mass of sealing material to seal the annular space between the end closure member and the body member, whereby upon pulling of the seam release strip, the end closure member is released for removal from said body member.

4,376,507

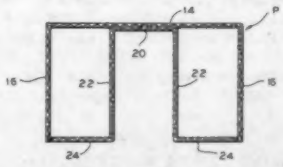
THREE-CELL PARTITION

James F. Naubeimer, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 8, 1981, Ser. No. 300,440

Int. Cl.³ B65D *5/48, 3/24*

U.S. Cl. 229—15 **2 Claims**



1. A partition structure, formed of a unitary blank of foldable paperboard having two sections arranged in parallel side-by-side relation, for providing three separate cells within an outer container or wrapper, said partition structure comprising:

(a) a major side panel adapted to lie against a major sidewall of an outer container and having foldably joined to opposite end edges thereof on parallel fold lines a pair of end

panels adapted to lie against opposed end walls of said outer container;

(b) a first minor side panel adapted to lie against a central portion of said major side panel and having one edge joined to an adjacent edge of said major side panel along a fold line which is disposed normal to said parallel fold lines;

(c) a pair of intermediate panels having corresponding end edges foldably joined to opposite end edges of said first minor side panel and extending normal to said major side panel in parallel relation with said end panels;

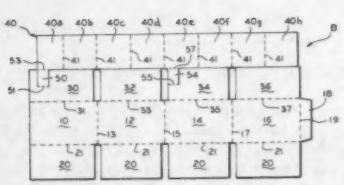
(d) a pair of second minor side panels foldably joined at corresponding end edges to adjacent end edges of respective intermediate panels and adapted to extend between said intermediate panels and said end panels and to lie against another major sidewall of said outer container.

4,376,508

CONTAINER WITH INTEGRAL PARTITION

Jeffrey M. Gardner, Wheaton, and Nicholas A. Philips, Glendale Hts., both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,289
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—28 R **2 Claims**



1. A container formed from a unitary blank of foldable paperboard and including an integral partition member for dividing the interior of the container into separate cells, said container comprising:

(a) first, second, third and fourth side wall panels foldably interconnected to form a tubular structure open at the ends;

(b) opposed pairs of upper closure flaps foldably joined to upper edges of said side wall panels for closing the top end of said tubular structure;

(c) first, second, third and fourth lower closure flaps foldably joined to lower edges of said first, second, third and fourth side wall panels respectively;

(d) a partition member consisting of eight serially arranged partition elements foldably joined to each other on parallel fold lines, said partition member being positioned within said tubular structure to provide separate cells; and

(e) connecting webs hingedly joining said first and third lower closure flaps

to the first and fifth partition elements of said partition member, each connecting web extending within the periphery of its respective closure flap and hingedly connected thereto, each said web further having a parallel hinge connection connected to the adjacent edge of the respective partition elements.

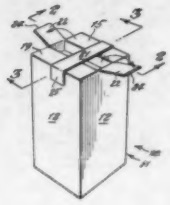
4,376,509

LIQUID CONTAINER WITH CARRYING HANDLE

George H. Schaffer, 607 Burritt St., Plantsville, Conn. 06479

Filed Jul. 18, 1980, Ser. No. 169,942
Int. Cl.³ B65D *5/46, 5/66, 5/74*
U.S. Cl. 229—52 B **3 Claims**

1. A liquid container with carrying handle, comprising, in combination, a rectangular-shaped container member that is blanked from a flat, plasticized sheet of cardboard, said container member including a bottom, a top and side walls bent up to form said container member, and including a downward recess across the top of said top wall, a carrying handle extending across said top wall and transversely spanning said cover and recess thereby allowing a person's finger to pass under said



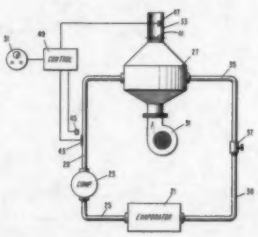
handle, two pouring spouts in said top wall recess, a pair of pivotable tabs extending from opposite ends of said recess to overlie said recess and cover said two pouring spouts, the distal end edges of said tabs extending under side edges of said handle.

4,376,510

WARNING DEVICE AND METHOD FOR A HEATING SYSTEM

Wayne H. Allard, 10304 Shesue St., Great Falls, Va. 22066

Filed May 6, 1981, Ser. No. 260,933
Int. Cl.³ G05D *23/00*
U.S. Cl. 237—2 B **19 Claims**



1. A warning device for a heat pump system comprising:

duct means for delivering heated air heated in the system to a space to be heated;

auxiliary heater means in said duct means, said auxiliary heater means being activated when the temperature in said space drops below a predetermined value;

means for sensing the temperatures of the ambient air around the heat pump system, the working fluid of the heat pump system downstream of a compressor for the heat pump system, and the heated air in the duct means downstream of said auxiliary heater means;

means for evaluating said temperatures;

warning means for indicating when said heated air temperature is greater than the working fluid temperature and the working fluid temperature is greater than or equal to the ambient air temperature.

4,376,511

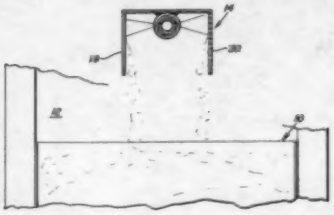
CO_2 SNOW FORMING COPPER LINE

Paul R. Franklin, Jr., 5211 W. Beaver St., Jacksonville, Fla. 32205

Filed Apr. 1, 1981, Ser. No. 249,897
Int. Cl.³ A01G *15/00*
U.S. Cl. 239—14 **7 Claims**

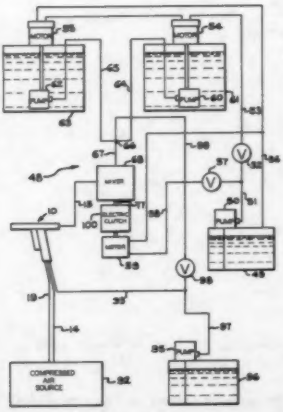
1. An apparatus for forming CO_2 snow, said apparatus in-

cluding a CO_2 line having an outlet end and an inlet end adapted for communication with a source of liquid CO_2 under pressure, a snow forming head, said head comprising a generally horizontal elongated laterally and downwardly opening channel member, a CO_2 discharge conduit disposed in and extending along said channel member, said conduit including opposite side small diameter outlet openings formed therein and spaced longitudinally therealong opening outwardly toward and spaced inward of the opposing sides of said channel member, one end of said conduit being closed and the other



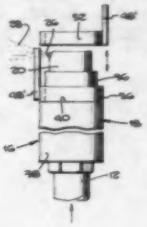
end of said conduit having said outlet end sealingly communicated therewith, at least the portion of said conduit having said small diameter outlet openings formed therein being of greater internal cross-sectional area than said CO_2 line, whereby the movement of liquid CO_2 under pressure from said line into said greater internal cross-sectional area of said conduit will effect at least initial expansion of said liquid CO_2 and movement of CO_2 outwardly of the outer ends of said small diameter outlet openings will effect further expansion of the CO_2 and result in a greater production of CO_2 snow from a given volume of liquid CO_2 supplied from said source.

4,376,512
COATING SYSTEM
Kenneth Kistner, P.O. Box 132A, Delta, Ohio 43515
Filed Nov. 20, 1980, Ser. No. 208,502
Int. Cl.³ B05B 7/04
U.S. Cl. 239—106 **8 Claims**



1. A system for mixing and spraying a multi-component high viscosity coating comprising a separate reservoir for at least two different components of the coating, a separate hydraulically operated pump for the material in each reservoir, means for supplying hydraulic fluid in series to said hydraulically operated pumps whereby said pumps are simultaneously rotated, said pumps pumping such different components from said reservoir at a predetermined fixed flow rate ratio to each other, means for folding together such pumped different components, said folding means having a separate inlet for each pumped component and a single common outlet, means for mixing said folded components, said mixing means being connected to said common outlet, applicator means for spraying such mixed components onto a surface, and purging means for cleaning such mixed components from said folding and mixing means and from said applicator means.

4,376,513
IRRIGATION STREAM SPLITTER
Jay L. Hagar, Grass Valley, Calif., assignor to The Toro Company, Minneapolis, Minn.
Filed Jun. 30, 1980, Ser. No. 164,593
Int. Cl.³ B05B 15/06, 3/08
U.S. Cl. 239—231 **14 Claims**



1. In a sprinkler head having a vertically disposed cylindrical body adapted for attachment to a source of irrigation fluid under pressure and a nozzle portion extending vertically longitudinally from the body and concentric therewith for continuous rotation to create a horizontal spray pattern over a circular area with water emitted as a stream from a nozzle opening in the nozzle portion, the attachment for splitting the stream which would otherwise strike the trunks of the trees when the sprinkler head is disposed between a plurality of trees to irrigate them to, thereby, prevent trunk rot, said attachment comprising:

(a) a first cylindrical collar adapted to be disposed concentrically about the cylindrical body, said first collar having gripping means on the inner surface thereof for gripping the cylindrical body when disposed concentrically thereabout an amount sufficient to hold said collar from moving out of position from the operational vibrations of the sprinkler head while allowing said collar to be manually rotated into a desired position;

(b) a first wedge-shaped fin member carried by said first collar on one end and disposed vertically close adjacent the nozzle portion with the narrow edge of the wedge facing the nozzle opening when the nozzle opening, a first tree, and said first fin member are in radial alignment whereby the emitted stream of fluid would strike the first tree trunk is split by said first fin member and the fluid thereof is directed to the area beside said first tree;

(c) a second cylindrical collar adapted to be concentrically disposed about said first cylindrical collar, said second cylindrical collar having gripping means on the inner surface thereof for gripping said first cylindrical collar when disposed concentrically thereabout an amount sufficient to hold said second collar from moving out of position with respect to said first collar from the operational vibrations of the sprinkler head while allowing said second collar to be manually rotated with respect to said first collar into a desired position; and,

(d) a second wedge-shaped fin member carried by said second collar on one end and disposed vertically close adjacent the nozzle portion with the narrow edge of the

wedge facing the nozzle opening when the nozzle opening, a second tree, and said second fin member are in radial alignment whereby the emitted stream of fluid which would strike the trunk of said second tree is split by said second fin member and the fluid thereof is directed to the area beside said second tree.

4,376,514
HOLDER FOR ELECTROSTATIC SPRAYING OF LIQUIDS

Ronald A. Coffee, Haslemere, England, assignor to Imperial Chemical Industries PLC, London, England

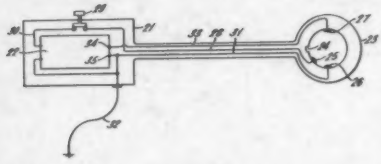
Division of Ser. No. 78,434, Sep. 24, 1979, Pat. No. 4,275,846, which is a continuation-in-part of Ser. No. 953,774, Oct. 19, 1978, Pat. No. 4,209,134. This application Dec. 18, 1980, Ser. No. 218,172

Claims priority, application United Kingdom, Sep. 26, 1978, 38180/78

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ B05B *5/02;* H01R *33/00*

U.S. Cl. 239—690 **7 Claims**



1. A holder for use in a sprayer for the electrostatic spraying of liquids, the sprayer including a liquid container having a body with an orifice for delivering liquids, a closure for sealing off the orifice prior to mounting of the container, and mounting means including a conductor of conductors, and the sprayer also including a low energy power supply, high voltage generator having input and output terminals, a spray nozzle at least part of the surface of which is electrically conductive and which communicates with the orifice, and an electrode disposed about the nozzle and insulated therefrom; said holder comprising:

a body carrying said high voltage generator;

mounting means for mounting the container to said holder with electric contacts complementary to the conductor or conductors on the container for connection to the output terminal of the high voltage generator; and

means for intermittently providing a pathway to earth from said holder for grounding the sprayer electrode when received by the holder.

4,376,515
APPARATUS FOR THE CONTINUOUS MANUFACTURE OF A MIXED FODDER

Niels Soe, Ryomgard, Denmark, assignor to Pindstrup Mosebrug A/S, Denmark

Filed Nov. 10, 1980, Ser. No. 205,630

Claims priority, application Denmark, Dec. 3, 1979, 5127/79

Int. Cl.³ B02C *18/12;* A47J *43/04*

U.S. Cl. 241—101 B **10 Claims**

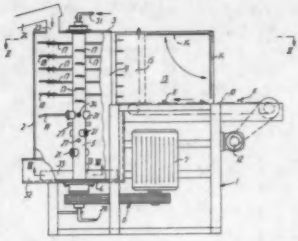
1. Apparatus for the continuous manufacture of a mixed fodder, the constituents of which comprise chopped straw, at least one solid additive and at least one liquid additive, said apparatus comprising

a stationary drum comprising a pheripheral wall and two end walls and having at one end thereof a straw bale infeed opening in its peripheral wall and at least one further infeed opening for said solid additive, and at its opposite end an outlet for the finished fodder mix,

means for feeding straw bales into said drum through said straw bale infeed opening,

a rotary shaft extending centrally through the interior of said drum and means for rotating said shaft at a relatively high rate of revolution,

a plurality of axially staggered chopping means secured to said shaft within a first longitudinal section thereof aligned with said straw bale infeed opening,



means for mixing said fodder constituents secured to said shaft within a second longitudinal section thereof intermediate said chopping means and said drum outlet,

the chopping means and mixing means being configured for conveying the chopped and mixed fodder constituents towards the outlet of the drum,

and nozzles extending into the interior of said drum for injecting said liquid additive towards the mixture of fodder constituents traveling along the peripheral drum wall towards the drum outlet.

4,376,516
SPOOLING MACHINE, METHOD AND APPARATUS TO PREVENT FORMATION OF CUT REMNANT THREAD PIECES

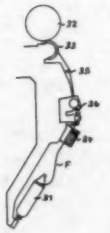
Erwin Leu, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Feb. 27, 1980, Ser. No. 125,136

Claims priority, application Switzerland, Mar. 8, 1979, 2242/79

Int. Cl.³ B65H *63/02, 63/06*

U.S. Cl. 242—36 **9 Claims**



1. In a spooling machine in which yarn or thread (F) is spooled from a payout spool (31) to a takeup package (32) having

means (36) sensing thread size and providing an "off-size" signal if the thread size exceeds predetermined threshold limits and if the thread is positioned outside of predetermined limits responsive to loss of tension simulating an "off-size" signal within the sensing means, and

thread cutting apparatus (1–6) including a cutter knife (2, 3) having a cutter blade and a counter anvil (1) towards which the knife moves during cutting, said cutter apparatus being positioned in the path of the thread from the

payout spool to the takeup package and the cutter knife being operative to move in a direction to sever the thread when the "off-size" signal is sensed,

and comprising, in accordance with the invention,

means to prevent cutting of the thread upon failure of thread tension comprising

a groove (4,4') formed in the anvil (1) and positioned to permit the cutter knife to penetrate therein, said groove having a depth which is deeper than the end position of the cutter blade upon movement of the cutter blade when responding to an "off-size" signal and having a width which is wider than the thickness of the cutter blade to permit movement of the cutter blade into the groove, with slack thread, without severing the thread.

7. In a spooling machine, a method to prevent formation of a cut remnant filament which may wind on package of thread being spooled with controlled tension from a payout spool (31) to a takeup package (32), which includes means (36) sensing thread-size and providing an "off-size" signal if the size exceeds predetermined threshold limits, and if the thread is positioned outside of predetermined limits responsive to loss of tension simulating an "off-size" signal within the sensing means, and having thread cutting apparatus (2–6) including a cut-off knife (2, 3) having a cutter blade and a counter anvil (1) having a groove (4,4') toward which the knife moves during cutting, the thread cutting apparatus being positioned in the path of the thread from the payout spool to the takeup package, and the knife being operative to move in a direction to sever the thread when the "off-size" signal is sensed, and which comprises the steps of

passing the thread in front of the cut-off knife out of contact with the blade edge (2);

and positioning a counter surface of the counter anvil (1) for the cutter blade from the knife edge at a location which is beyond the end position of the cutter blade when responding to an "off-size" signal to permit, upon movement of the knife, an untensioned, broken thread in front of the knife to escape beyond said end position and thus escape being cut, while effecting cutting of a tensioned, unbroken thread in front of the cut-off knife.

4,376,517

METHOD AND APPARATUS FOR DEPOSITING YARN

Heinz Schippers, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,804

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014516

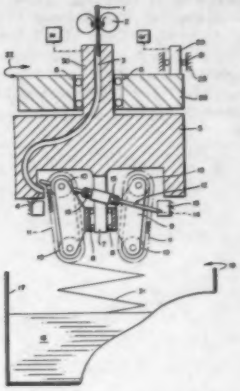
Int. Cl.³ B65H *54/82*

U.S. Cl. 242—47 **10 Claims**

1. A method for depositing a continuously forwarded yarn into a round, rotating spinning can wherein the yarn is conducted in its axial direction through a guide channel having an outlet guide which orbits in a substantially horizontal circular path at about the linear velocity of the yarn and wherein the yarn is subsequently permitted to fall freely in helically shaped windings onto the circular collecting plane of said spinning can, the improvement which comprises:

shaping the yarn windings before their impingement onto said collecting plane by means of axially extending shaping surfaces placed in contact with the yarn windings so that each winding defines, in its projection onto said collecting plane of the spinning can, an elongated, closed curve with rounded ends; and

moving the windings, as a whole, horizontally with reference to said collecting plane such that said closed curve defined by each winding is always disposed with one end on the outer circumference of said collecting plane of the rotating spinning can and with the other end being moved back and forth in an annular zone between the outer circumference of the collecting plane of the spinning can and its center.



4,376,518

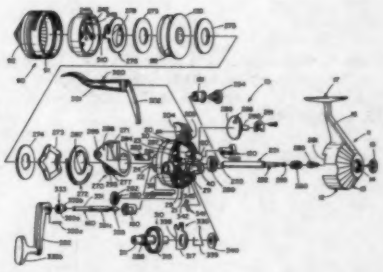
SNAP-IN ANTI REVERSE SELECTOR

Richard L. Gifford, Adair; Lorens G. Hlava, and Elvis W. Moss, both of Tulsa, all of Okla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jul. 31, 1981, Ser. No. 289,035

Int. Cl.³ A01K *89/01, 89/02*

U.S. Cl. 242—84.2 R **15 Claims**



1. In a spinning type reel having a selective anti-reverse device and an actuator extending through an opening in the reel housing for actuating the anti-reverse device, the improvement wherein the actuator comprises:

an exteriorly situable head portion;

a first portion extensible within the housing and engageable with the anti-reverse device;

a second portion extensible within the housing and movable relative to the first portion;

means on the second portion engageable at the interior of the housing to retain the actuator within the reel housing whereby the actuator may be snap-fit within the opening in the housing; and

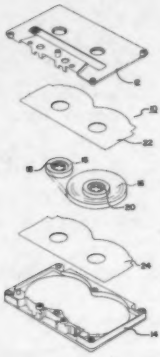
a protrusion is included on the second portion which protrusion engages the reel housing and urges the first portion into engagement with the housing.

4,376,519

LUBRICANT SHEET FOR MAGNETIC TAPE CASSETTE

Toshihiko Ishida, Komoro; Hitoshi Azegami, and Yoshio Kawakami, both of Toubu, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Division of Ser. No. 146,848, May 5, 1980, abandoned. This application Jun. 9, 1981, Ser. No. 271,867
Claims priority, application Japan, May 7, 1979, 54-59602[U]
Int. Cl.³ G03B *1/04;* G11B *15/32*
U.S. Cl. 242—199 1 Claim



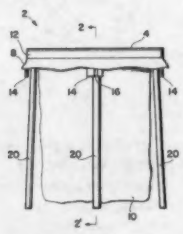
1. A magnetic tape cassette wherein substantially the entire inside of the cassette is visible from the outside comprising a length of magnetic tape wound on a pair of reels housed in a transparent case formed from an upper half-case and a lower half-case fastened together, and a transparent lubricant sheet comprising a transparent base incorporating an antistatic agent, and a releasetype silicone coating adhered to at least one side of said base, said lubricant sheet disposed between said reels and the inner surfaces of said half-cases such that a silicone-coated side of said lubricant sheet faces said reels.

4,376,520

BAG STAND

Nelson A. Wetherington, 167 Ridge Rd., NW., Largo, Fla. 33540

Filed Sep. 8, 1981, Ser. No. 299,674
Int. Cl.³ A63B *55/04*
U.S. Cl. 248—97 3 Claims



1. A bag stand, comprising:

a horizontal base ring having a generally circular annular shape, with a V-shaped circumferential groove in the periphery thereof, said base ring having a central opening up through which passes the upper edge of a bag which lays over the top of said base ring and drapes down over the periphery thereof, covering said circumferential groove;

an elastic ring of V-shaped cross section composed of an elastomeric material, adapted to fit over said downwardly draped portion of said bag, compressing the bag into said circumferential groove of said base ring, for the frictional retention thereof;

a plurality of support flanges integrally formed with said base ring and molded as a single unit with said base ring from a plastic material, and depending downwardly and outwardly therefrom at an angle of approximately five degrees with respect to the vertical, each said flange having a vertical slot therein which opens into an upper horizontal slot;

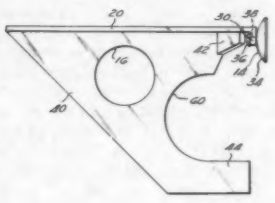
a plurality of support legs, one for each of said plurality of flanges, each having a stud projecting from the side thereof, which slideably engages said respective vertical slot and locks into said upper horizontal slot of the respective support flange, each said stud having a head portion for retaining said stud within the respective slots in the respective flange, said plurality of support legs depending downwardly and outwardly from said base ring at an angle of approximately five degrees with respect to the vertical, supporting said upper edge of said bag at a convenient elevated position on said base ring.

4,376,521

GLASS SHELF SUPPORT

Max Walters, 4351 Boardwalk Dr., Apt. 306, Huntington Harbor, Calif. 92649

Filed Jun. 30, 1980, Ser. No. 163,944
Int. Cl.³ F16B *47/00*
U.S. Cl. 248—206 R 5 Claims



1. A device for supporting a shelf extending outward from a wall comprising:

(a) a top member having an end proximal to said wall and an end distal to said wall, said member in a horizontal position forming a surface suitable for receiving said shelf;

(b) a U-shaped projection extending downward from said proximal end forming a recess sized to receive a neck portion of a suction cup; and

(c) means for supporting said top member depending inward away from said distal end, said supporting means having an elongate foot portion for abutting the wall, said foot portion extending inward further than said U-shaped projection to permit the foot portion to abut the wall when said top member is in a horizontal position.

4,376,522

AIRCRAFT SEAT

Harold H. Banks, New Britain, Conn., assignor to Kidde, Inc., Belleville, N.J.

Filed May 18, 1981, Ser. No. 264,638
Int. Cl.³ A78B *97/00;* B60P *7/08;* B61D *45/00*
U.S. Cl. 248—503.1 3 Claims

1. An aircraft seat adapted to be releasably secured to a track member having a plurality of longitudinally spaced openings interconnected by slots in the top surface thereof and an internal channel communicating with these openings and slots, comprising

a rear leg,

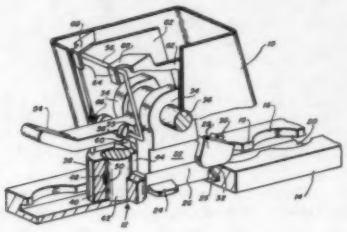
a track fitting including lug means selectively sized and

located for downward insertion into the track channel through selected track openings,

mounting pin means for securing said track fitting to said rear leg,

plunger means displaceable in a selected direction and selectively sized for mating insertion into a track opening, said plunger means including a horizontally extending bore means,

a lever pivotally mounted on said mounting pin means and having a medial bore,



shaft means passing through said lever medial bore and said plunger horizontal bore means interconnecting same,

spring clip means including said shaft means,

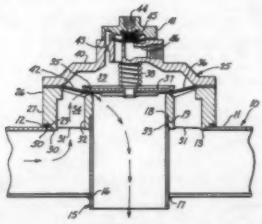
catch means secured to said rear leg for retaining said spring clip means at a selected orientation substantially perpendicular to said lever and for preventing upward displacement of said lever, said catch means being selectively shaped so that rotation of said spring clip away from said lever a predetermined amount will free said spring clip means permitting upward displacement of said lever.

4,376,523

HEADER AND VALVING ASSEMBLY

Albert H. Goyen, 17 Marie Dodd Crescent Lakehurst, Sydney, Australia

Filed Apr. 30, 1981, Ser. No. 259,086
Int. Cl.³ F16K *31/126, 31/128, 7/17*
U.S. Cl. 251—61.1 **9 Claims**



1. In combination: a header pipe having an internal flow passage, a wall with a sealing surface, and an aperture through said sealing surface into said flow passage;

an outlet pipe mounted to and passing through said wall, crossing said flow passage and having a threaded end;

a diaphragm-type valve having a body which includes a peripheral skirt adapted to bear against said sealing surface, a web, a threaded tubular member supported by said web threadedly engaged to the said end of said outlet pipe and operative to bring said skirt toward and against said sealing surface, thereby to mount said diaphragm-type valve to said header pipe, said web providing a fluid passage extending between said flow passage and said outlet pipe, said diaphragm-type valves being disposed outside of said header pipe, a valve seat and a valving diaphragm in said body in fluid controlling position between said end of said outlet pipe and said fluid passage, and port means for admitting control pressure to said diaphragm; and

peripheral seal means disposed and sealing between said skirt and said sealing surface.

4,376,524

LOW STRESS STEM CONNECTION STRUCTURE FOR A NON-RISING STEM TYPE GATE VALVE

William S. Shelton, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 26, 1980, Ser. No. 210,424
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—86 **1 Claim**

1. A gate valve comprising:

a valve body in which is formed an open ended valve chamber and inlet and outlet fluid passages communicating with the valve chamber, a valve seat positioned about each said inlet and outlet fluid passages adjacent said valve chamber, a bonnet assembly forming a closure for said valve chamber, an axially rotatable non-rising valve stem carried by said bonnet assembly and having a threaded inner end section;

a gate member disposed in said valve chamber and movable between open and closed positions relative to said fluid passages to control fluid flow through said valve, said gate member having an externally threaded extension with a longitudinal bore in which the inner end section of said stem is received, said longitudinal bore having a diameter substantially larger than the diameter of the stem to provide a clearance between the stem and the gate member, the upper end of the gate extension having a pair of opposed slots aligned in a direction parallel to the direction of fluid flow through said flow passages;

a stem nut threaded on an end of said stem and having a pair of ears fitting within said opposed slots whereby rotation of said stem effects movement of said gate member between open and closed positions; and interfitting ears and slots, and the clearance between the stem and gate member, permitting movement of said gate member relative to the longitudinal axis of said stem in the direction of fluid flow through said fluid passages; and,

an inverted cup-shaped gate nut threaded onto the externally threaded extension of said gate member and enclosing said stem nut, said gate nut having an opening in its upper end receiving said stem and providing a clearance between said gate nut and said stem to permit said movement of said gate member relative to the longitudinal axis of said stem in the direction of fluid flow through said flow passages whereby a low stress connection is formed between said stem and said gate member to facilitate opening and closing of the gate valve.

4,376,525

COUPLINGS FOR FLEXIBLE CONDUITS AND THE LIKE

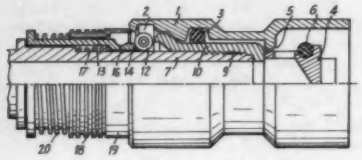
Raoul Fremy, 1, rue des Iris, 91540 Mennecy, France

Filed Jul. 16, 1980, Ser. No. 169,621

Claims priority, application France, Jul. 25, 1979, 79 19168; Jun. 6, 1980, 80 12620

Int. Cl.³ F16L *37/28*

U.S. Cl. 251—149.6 **9 Claims**



1. In a coupling for flexible conduits and the like comprising a female element comprising a body having an axial bore having internally a peripheral locking recess, and a male element comprising a tip on which is mounted a locking device adapted to engage in the axial bore of the female element, said locking device comprising an engagement element radially displaceable to come into engagement in the locking recess provided in the axial bore of the female element and a locking control device controlling the radially outward displacement of the engagement element toward its locking position and adapted to be brought positively into an unlocking position permitting disengagement of the engagement element from the recess of the female element, the locking control device comprising a sleeve mounted longitudinally movably on the male element, the end of said sleeve directed toward the engagement end of the male element having a cam surface coacting with the engagement element so as to displace the engagement element radially outwardly, and a spring resiliently urging said sleeve toward the locking position in which said sleeve presses the engagement element radially outwardly; the improvement comprising a release ring slidably mounted on the periphery of the locking control device so as, in an uncoupled condition of the coupling, to come into engagement over the engagement element to keep the engagement element in its retracted position toward the interior of the body of the male element, the release ring and the body of the female element having interengageable portions such that, during coupling, the body of the female element contacts the release ring and moves it back out of engagement from over the engagement element thereby permitting the engagement element to move radially outward into the locking position in the locking recess of the female element.

4,376,526

SEAL ASSEMBLY AND VALVE

John W. Freeman, Houston, Tex., assignor to Seaboard Wellhead Control, Inc., Houston, Tex.

Filed Aug. 4, 1980, Ser. No. 174,821

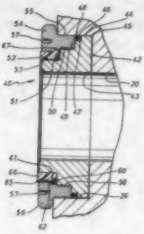
Int. Cl.³ F16K *3/02*

U.S. Cl. 251—328 **10 Claims**

1. A seal assembly for use in a valve, comprising:

an annular collar having an essentially cylindrical inner surface, first and second ends, and an outer surface including (a) a first, essentially cylinder section extending from the first end toward said second end and being suited for fitting into an annular recess in a valve body, (b) a second, essentially cylindrical section having threads thereon, and (c) a third, essentially cylindrical section between said second section and said second end and having an outer diameter less than that of said second section;

an annular retainer cap having an inner surface including (a) a threaded section complementary to the threads on the second section of the collar to accommodate the cap being threaded onto the collar, (b) a first essentially cylindrical section radially spaced from and facing a portion of the third section on the collar when the cap is threaded onto the collar, and (c) a retaining surface between the threaded and essentially cylindrical sections thereof; and



an annular sealing member for placement between the collar and the cap and including an end face suited for engagement with a valve element and a contour complementary to the retaining surface on the cap.

4,376,527

DEVICE FOR TENSIONING A REINFORCING STRAND

Birger Ludvigson, Södra Vägen 38, Göteborg, Sweden (S-41254)

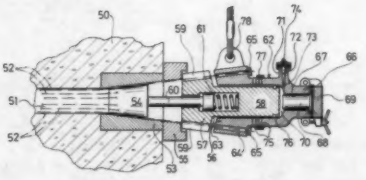
PCT No. PCT/SE79/00067, § 371 Date Nov. 16, 1979, § 102(e) Date Nov. 16, 1979, PCT Pub. No. WO79/00856, PCT Pub. Date Nov. 1, 1979

PCT Filed Mar. 26, 1979, Ser. No. 177,767

Claims priority, application Sweden, Mar. 31, 1978, 7803640

Int. Cl.³ B28B *23/04*; F01B *1/01*

U.S. Cl. 254—29 A **8 Claims**



1. A device for tensioning a reinforcing strand in a concrete structure with a terminating jerk by means of a ram attachable to the end of the strand and comprising a cylinder, a piston cooperating therewith, means for accepting a charge of combustible material which produces combustion gas upon burning and for supplying said gas to the cylinder, and means for limiting the length of the stroke of the piston when subjected to the influence of the gas, said means for limiting the stroke of the piston comprising a series of exhaust openings in the wall of the cylinder, located at different axial distances from the gas inlet end of the cylinder, as well as a slide manipulable to maintain at least one of said series open.

4,376,528

STEEL PIPE HARDENING APPARATUS

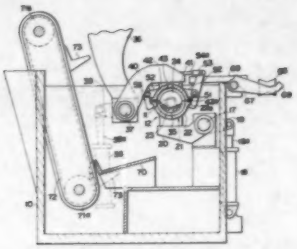
Toshio Ohshimatani, Aichi; Yukihiro Mimura, Handa; Kengo Nozawa; Tatsuo Maguchi, both of Aichi, and Keiichiro Takitani, Nagoya, all of Japan, assignors to Kawasaki Steel Corporation, Kobbe, Japan

Filed Sep. 3, 1981, Ser. No. 299,202

Claims priority, application Japan, Nov. 14, 1980, 55-160285; Dec. 29, 1980, 55-187995; Feb. 2, 1981, 56-14093[U]

Int. Cl.³ C21D 9/08

U.S. Cl. 266—114 22 Claims



1. An apparatus for hardening a steel pipe by quenching it with a liquid coolant, comprising

an elongated cylindrical assembly including a casing and a cover removably mated with the casing to define a cylindrical space therebetween for receiving the steel pipe, said cover being removed from said casing to allow insertion and removal of the steel pipe,

support means disposed within said cylindrical assembly for supporting the steel pipe with its central axis being parallel to the central axis of said cylindrical assembly, and

injection means disposed adjacent one end of said cylindrical assembly for injecting the coolant into and around the steel pipe in said cylindrical assembly in the longitudinal direction thereof.

4,376,529

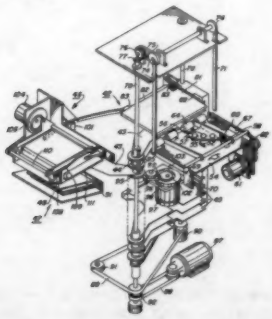
OUTPUT STATION FOR REPRODUCING MACHINE

Clifford L. George, Macedon, and Wayne R. Smith, Henrietta, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1980, Ser. No. 135,600

Int. Cl.³ B42B 2/00

U.S. Cl. 270—53 8 Claims



1. An output station for a reproducing machine comprising a sorter including a plurality of copy sheet collecting trays arranged in a vertical array, sheet transport means to transport copy sheets from the reproducing machine to the sheet sorter, said sheet transport having an entrance portion adjacent said reproducing machine and a sheet exit portion adjacent said sorter, said individual copy sheet collecting trays being mounted in a vertical array on an elevating means and including means to drive said elevating means vertically upwardly and downwardly past the sheet exit portion of said copy sheet transport to facilitate the sequential insertion of the copy sheet from the copy sheet transport to the individual trays, each of said copy sheet collecting trays also being pivotally mounted to said elevating means for individual pivotal movement about a vertical axis and further including means to sequentially swing said individual copy sheet collecting trays containing sets of collated sheets in an arc about said vertical axis from the sheet collecting position adjacent the sheet exit portion of said sheet transport to a finishing station, means to deliver finished sets of collated copy sheets to a finished set unloading station, said copy sheet collecting trays having means to corner register individual copy sheets as they are inserted in the individual copy sheet collecting trays and means to maintain the corner registration of the sets of collated sheets as they are transported from the sheet collecting position to a finishing station.

4,376,530

APPARATUS FOR DIVIDING STACKED SHEETS AND FOR FEEDING OUT THE SAME

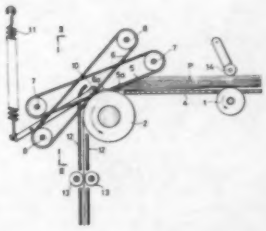
Naoto Akai, Nagaokakyo, Japan, assignor to Jujo Engineering Co., Ltd., Nagaokakyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,246

Claims priority, application Japan, Dec. 21, 1979, 54-167194

Int. Cl.³ B65H 3/52

U.S. Cl. 271—10 4 Claims



1. An apparatus for dividing stacked sheets and for feeding out the sheet one by one comprising a feed roller which delivers stacked sheets, a friction roller rotating in the sheet-feeding direction, a loosely stretched first dividing belt arranged to have substantial face-to-face contact with the surface of the friction roller at the sheet-introducing side of the friction roller, said first dividing belt having substantially no tension applied thereto, and a tightly stretched second dividing belt arranged substantially tangentially to the surface of the friction roller and having a certain tension applied thereto, wherein sheets are passed between the first dividing belt and the friction roller and between the second dividing belt and the friction roller to be divided and fed out one by one separately.

4,376,531

DEVICE FOR TRANSPORTING SHEETS ON PRINTING MACHINES

Anton Breunig, Dilsberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,932

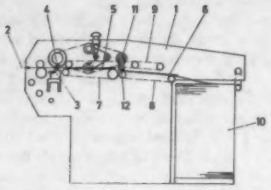
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903596

Int. Cl.³ B65H 29/66

U.S. Cl. 271—202 2 Claims

1. Device for transporting sheets on printing machines having a rejector shaft driven in rhythm with a flow of sheets, the

rejector shaft carrying cams for deflecting the sheet ends downwardly to form an overlapping, fish-scalelike flow of the sheets comprising a belt drive for the rejector shaft, and means for adjusting said belt drive so as to vary the instant of movement of the cams relative to the flow of sheets, said adjusting



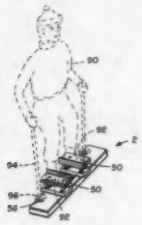
means comprising a swivelable double-arm lever disposed between a driving belt strand and a driven belt strand of said belt drive, respective rollers mounted on the arms of said double-arm lever and engageable with both of said belt strands for deflecting said belt strands, and an adjusting spindle engaging one of the arms of said double-arm lever.

4,376,532

EXERCISER FOR MUSCLES USED IN SKIING

Vernon D. Hunstad, 327 Hampden Dr. NE., Cedar Rapids, Iowa 52402

Filed Mar. 4, 1981, Ser. No. 240,526
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—97 **8 Claims**



2. Exercise apparatus comprising
a base,
a first rotatable platform member attached to said base,
a second rotatable platform member attached to said base and spaced from said first rotatable platform member,
a plurality of tensioning members affixed to and interconnecting the opposing edges of each of said platform members,
each of said tensioning members being positioned substantially parallel to the other tensioning members,
said tensioning members resisting rotational movement of said platform members.

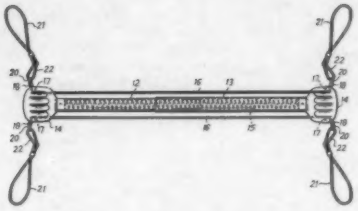
4,376,533

PUSH AND PULL TYPE EXERCISING DEVICE

Gert F. Kolbel, Hanover, Fed. Rep. of Germany, assignor to Compret N.V., Amsterdam, Netherlands

Filed May 26, 1981, Ser. No. 267,112
Claims priority, application United Kingdom, Jun. 4, 1980, 8018265
Int. Cl.³ A63B *21/02, 21/32*
U.S. Cl. 272—137 **6 Claims**

6. A physical exerciser for push and pull exercises comprising:
an elongate telescopic system having ends, the telescopic system having a normal extended position, said system being contractable longitudinally by the application of manual pressure; resilient biasing means arranged to resist said longitudinal contraction of said system; a pair of flexible substantially inextensible tension means, said tension means extending longitudinally on opposite sides of the system and connecting said ends of said system so that pulling apart of said tension means on opposite sides of said system contracts said system against said biasing means; at least two guide members each mounted adjacent an end of the system, said tension means having parts adjacent said ends of the system passing around the guide



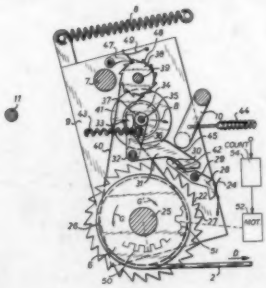
members, at least two stop means attached to the tension means, so that they are adjacent said parts passing around the guide members in said extended position, each stop member acting in said position to restrain the associated tension means from moving inwards around the associated guide member, and at least two separate unrestrained pull members connected to said tension means adjacent said stop members such that pulling on a pull member moves the associated tension means connected thereto around the guide member to contract the system.

4,376,534

BOWLING PIN CABLE ADJUSTMENT ARRANGEMENT

August Schmid, Schwerzenbach, Switzerland, assignor to Serania AG, Glarus, Switzerland

Filed Apr. 30, 1981, Ser. No. 259,069
Claims priority, application Switzerland, May 7, 1980, 3542/80
Int. Cl.³ A63D *5/08*
U.S. Cl. 273—44 **7 Claims**



1. In a bowling pin positioning apparatus having a plurality of bowling pins (1), including individual cable means (2) secured to the heads of the pins for suspending the pins,
a bowling pin cable adjustment arrangement having
a support frame (4);
individual cable storage drums (6), each having a predetermined length of cable wound thereon in at least a portion of one storage loop;

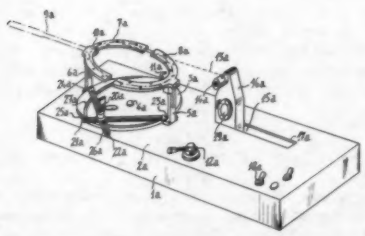
a plurality of rocker plate elements (9) pivotably mounted on the support frame (4);
resilient biassing means (8) holding said rocker plate elements in predetermined position on the frame;
a ratchet (22,28) preventing rotation of the storage drums in a direction (D) of feeding cable from the storage drum to the respective pin;
controllable ratchet release means (10) positionable for engagement with the ratchet latch (28) upon deflection of the rocker plate element (9) and hence of the ratchet counter the resilient biassing means (8) to then permit release of cable from the storage drum;
means (5, 16, 13, 17, 18, 19) in engagement with the cable means (2) and selectively controlling the length of cable between the frame and the pins to thereby position the pins on the floor of a bowling alley, or at an elevated position thereabove;
a belt sheave (26) rotatable secured to the cable storage drum (6);
a belt (40) being looped about said belt sheave (26);
a spring-loaded belt tensioning roller (34) in engagement with said belt;
and operating means (31) engageable by said controllable ratchet release means (10) and with said belt tensioning roller (34) to unload the belt tensioning roller when said rocker plate element (9) has pivoted from said predetermined position and said ratchet release means has unlatched the ratchet latch (28).

4,376,535

MACHINE FOR STRINGING RACKETS

Andre Muselet, and Jacques Muselet, both of Tourcoing, France, assignors to Snauwaert & Depla, Roselare, Belgium

Filed Dec. 18, 1980, Ser. No. 217,891
Claims priority, application France, Feb. 18, 1980, 80 04385
Int. Cl.³ A63B 51/14
U.S. Cl. 273—73 A **13 Claims**



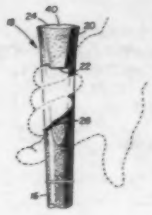
1. In a racket-stringing machine comprising a supporting table, and on the supporting table a cradle for locking a racket frame in position, a movable clamp **20***a* for temporarily immobilizing a racket string, means for applying tension to a racket string which is stationarily secured by means of said movable clamp in one zone of the frame, and means mounting said tensioning means freely displaceably in sliding motion in a second zone of said frame as a result of a tractive force exerted on one zone of the racket string located beyond the second zone with respect to the first; the improvement comprising two substantially horizontal arms **21***a*, **22***a* on which said movable clamp **20***a* is mounted, said arms being located at slightly different heights and being rotatably displaceable about spaced vertical axes **23***a*, **24***a* located on each side of the cradle in diametrically opposite relation as seen from above, the length of each said arm being shorter than the distance between said two axes **23***a*, **24***a* and the point of intersection of said arms being such as to describe at least the entire internal surface of the racket frame and part of the periphery of said frame.

4,376,536

GOLD CLUB GRIP CONFIGURATION

Harry L. Martin, 1878 Pomar Way, Walnut Creek, Calif. 94598

Filed Jul. 21, 1981, Ser. No. 285,779
Int. Cl.³ A63B 53/14
U.S. Cl. 273—81.4 **3 Claims**



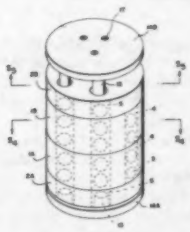
3. A conical shaped golf club grip having a cap portion at its base end, said cap portion formed with a button-hook style boss, said boss having a downwardly directed projection defining a curved crotch; said grip defining a flat surface adjacent said curved crotch, said flat surface smoothly transitioning into said crotch.

4,376,537

ROTARY PUZZLE DEVICE

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Dec. 30, 1980, Ser. No. 221,292
Claims priority, application Japan, Oct. 23, 1980, 55-148562; Nov. 25, 1980, 55-166069
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **6 Claims**



2. A rotary puzzle device comprising:
at least one rotary cylindrically shaped indicator having at least two longitudinal puzzle holes provided therein and having a central longitudinal axis, said rotary indicator further being transparent;
a pair of shunting cylindrically shaped bodies, each of said bodies being provided on opposite sides of said rotary indicator and having a central axis which corresponds to said central axis of said rotary indicator, said bodies being rotatable relative to said rotary indicator, said bodies further being transparent;
at least one shunting hole provided longitudinally in said bodies and corresponding to said puzzle holes;
a pair of end discs each of said discs being provided on opposite sides of said shunting bodies and having a central axis which corresponds to said central axis of said rotary indicator, said discs being coupled together such that they move together and slide back and forth longitudinally of said rotary indicator and shunting bodies;
at least one projection provided on each of said end discs, a

number of said projections corresponding to the number of shunting holes; and

a plurality of puzzle elements provided in said puzzle and shunting holes;

whereby said puzzle elements may be moved about in said puzzle by sliding said discs back and forth and rotating said rotary indicator relative to said shunting bodies.

4,376,538

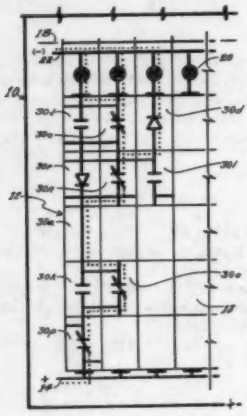
EDUCATIONAL GAME FOR CONSTRUCTION AND IDENTIFYING ELECTRICAL AND ELECTRONIC CIRCUITS

Michael P. Keenan, 95 Ponderosa Dr., Hanover, Mass. 02339

Filed Sep. 22, 1980, Ser. No. 189,724

Int. Cl.³ A63F *3/00*; C09B *1/04, 23/8*

U.S. Cl. 273—275 3 Claims



1. Educational game useful for teaching the recognition of electrical and electronic instrumentalities and the construction and tracing of electrical and electronic circuits comprising

(a) a plurality of modules of predetermined shape each provided on its top surface with a visual representation symbolizing an electrical or electronic instrumentality for use in constructing simulated electrical or electronic circuits;

(b) a game board divided into two playing areas in opposition to one another, each said playing area defined by an outer row of adjacent, abutting playing positions and an inner row of adjacent, abutting playing positions, and a plurality of rows of adjacent, abutting playing positions located between said outer and inner row whereby said rows of playing positions define a plurality of horizontal and vertical rows of adjacent, abutting playing positions, each said playing position being of the same predetermined shape as each said module for location of one of said modules in the simulated construction of an electrical or electronic circuit, a line provided on each said playing area adjacent said outer row of adjacent, abutting playing positions simulating a positive lead from a power source, a line provided on each said playing area adjacent said inner row of adjacent, abutting playing positions simulating a negative lead from a power source, said positive and negative leads being connected respectively to each playing position in the outer and inner rows of playing positions whereby a plurality of parallel potential circuits are provided, and an indicating means represented as a lamp located between each playing position in the said inner rows and said simulated negative leads for simulating the completion or blocking of an electrical circuit; and

(c) colored markers for placement on the said indicating means to show when a player's electrical circuit is completed or blocked.

4,376,539

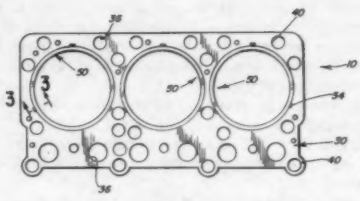
HEAD GASKET ASSEMBLY FOR DIESEL ENGINES

John W. Baldacci, Arlington Heights, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed May 27, 1982, Ser. No. 382,707

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—1 12 Claims



8. A method of sealing a diesel internal combustion engine comprising the steps of providing a diesel head gasket assembly having a heat-sensitive, multilayered main gasket body comprising a metallic layer and at least one heat-sensitive sealing layer of a filler and an impregnant, said main gasket body defining at least one combustion opening and a plurality of apertures, and further having a fire ring suspended in each said combustion opening, each said fire ring comprising a metallic annulus closely confronting the peripheral edge of the associated combustion opening and a plurality of spaced tabs bonded to said annulus, means weakly bonding said tabs to said annulus, each said tab comprising a central web bonded to said annulus and a pair of spaced arms overlying and embracing the main gasket body thereby to support and maintain said annulus in said combustion opening closely confronting the peripheral edge of said opening,

positioning said gasket assembly between the head and block of said engine, and

closing said head and block and, while doing so, relocating said annulus to a different elevation relative to said main gasket body than the initial elevation of said annulus.

4,376,540

GAS SEAL FOR SHAFTS WITH A COMPENSATING RING

Joachim Kotzur, Oberhausen, and Manfred Heinen, Rees, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,343

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045475

Int. Cl.³ F16J *15/36, 15/40*

U.S. Cl. 277—3 9 Claims

1. A gas seal for a shaft rotatable in a housing comprising:

a dimensionally stable rotating seal ring connected to the shaft for rotation therewith;

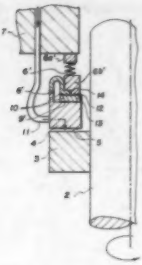
a diaphragm connected to the housing for exerting an axial bias with respect to the rotating seal ring;

a non-rotating seal ring connected to the diaphragm and defining with the rotating seal ring a radial seal gap, said non-rotating seal ring made of a material different from that of said diaphragm;

gas supply means connected to said non-rotatable seal ring for supplying gas to the seal gap; and

a compensating ring made at least in part of the same material as said non-rotating seal ring, connected on one side and at one radial end to said non-rotating seal ring and at

an opposite side, and at a place spaced from said one radial end to said diaphragm, said compensating ring having a



slide seat surface engaged on a surface of said non-rotating ring spaced from said one radial end.

4,376,541

AXIALLY AND RADIALLY EFFECTIVE BEARING SEAL

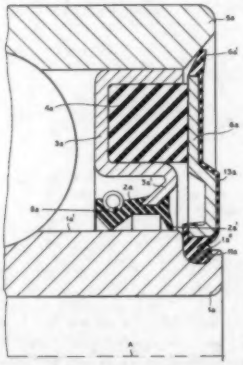
Wilhelm Walter, Reith, and Peter Dreschmann, Dittelbrunn, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,541

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 8032122[U]

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 10 Claims



1. A seal assembly for engagement between at least one body having an outwardly directed cylindrically annular surface centered on an axis and an annular and planar surface perpendicular to and centered on said axis and another body having an inwardly directed cylindrically annular surface centered on said axis, said seal assembly comprising:

a rigid C-section support ring fixed to said inwardly directed surface and open axially toward said planar surface;

an elastomeric radial ring seal having an outer periphery vulcanized to said support ring and an inner periphery radially inwardly engaging said outwardly directed surface; and

an elastomeric axial ring seal received in said support ring and engaging axially against said planar surface.

4,376,542

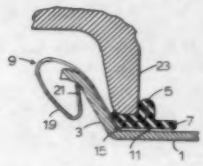
HOPPER DOOR GASKET STRUCTURE

James J. Hennessy, Chambersburg, Pa., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Filed Jul. 29, 1981, Ser. No. 288,062

Int. Cl.³ B61D *7/20*

U.S. Cl. 277—189 6 Claims



1. A gasket structure applicable to a hopper door edge and comprising an elongated flexible body of compressible material of substantial thickness with a tangentially projecting rib, and a plurality of relatively short narrow clips of thin metal spring material positioned transversely of said elongated flexible body and each comprising a straight end portion underlyingly abutting the body and rib of said gasket, said straight end portion incorporating means securing it directly to said rib, a straight intermediate portion angulated with respect to said straight end portion, and a second end portion curved in the opposite direction from the angulation of said straight intermediate portion with respect to said straight end portion to form a relatively narrow substantially closed loop elongated in the same general direction as said intermediate portion and having a straight terminal portion inturned to approach said intermediate portion at an acute angle to facilitate the reception therebetween of the rim of the door, said terminal portion terminating in a transverse edge for gripping engagement with the door rim, said transverse edge being serrated to enhance the gripping engagement of said clips to the door rim and resist shifting of said clips and the gasket structure peripherally of the door.

4,376,543

DUST EXCLUDING DEVICE

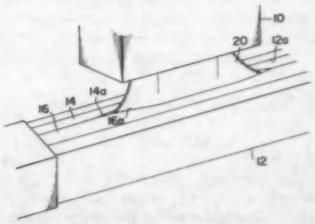
Seiji Sakagami, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,402

Claims priority, application Japan, Aug. 15, 1980, 55-115689[U]

Int. Cl.³ F16J *15/16*

U.S. Cl. 277—237 R 6 Claims



1. A dust excluding device comprising: flexible shield members disposed at opposite sides of an opening formed in a hollow casing along a line of movement of a movable member and having the forward ends thereof being brought into abutting contact with each other; and a neck adapted to locally push open the abutting contact portions of the shield members, for imparting a displacement of the movable member at the out-

side of said hollow casing to the interior of said hollow casing through said opening; characterized in that, at least at localities brought into contact with the abutting contact portions of the shield members, the end portions of said neck in the moving directions thereof are each formed into a letter "V" shape, the tip of which obliquely recedes from inside to outside of said hollow casing.

4,376,544

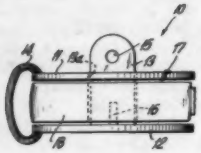
TOW BAR LOCK

Vincent E. Sette, 25 S. Cherry Valley Ave., West Hempstead, N.Y. 11552, and Edward Fellman, 1272 E. 85th St., Brooklyn, N.Y. 11236

Continuation of Ser. No. 78,749, Sep. 25, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,470

Int. Cl.³ B60D *1/00*; B60R *25/00*; E05B *73/00*

U.S. Cl. 280—507 **4 Claims**



1. Apparatus for locking a tow bar having an apertured end, comprising:

a bottom underplate;

a top coverplate, said bottom underplate and said top coverplate being of substantially uniform size and shape so as to receive therebetween and cover the apertured end of the tow bar;

an elongate pintle affixed to and projecting from the upper surface of said bottom underplate;

a centrally disposed through aperture formed in said top coverplate;

a locking aperture formed in the distal end of said pintle for receiving a locking device therein, whereby when said bottom underplate and said top coverplate are arranged to cover the apertured end of the tow bar, said pintle being of a length such that said pintle extends through said aperture and said locking aperture is above the upper surface of and extends above the plane of said top coverplate for cooperating with the locking device to prevent separation of said bottom underplate and said top coverplate; and wherein

said elongate pintle is affixed to said upper surface of said bottom underplate by means of a plurality of angularly disposed reinforcement members affixed to said pintle and to said upper surface of said bottom underplate.

4,376,545

SKI BRAKE

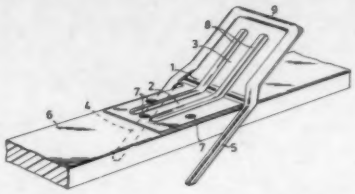
Ake Sandorf, Örngrind 3, 951 47 Lulea, Sweden

Filed Dec. 9, 1980, Ser. No. 214,787

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **5 Claims**

1. A ski brake, comprising: a bottom plate made from flexible sheet material which in its turn comprises an attachment plate portion adapted to be mounted on the upper surface of a ski and a thrust plate portion structurally integral with the attachment plate portion and two brake arms connected to and integral with the thrust plate portion and located in the same plane as on both sides of the thrust plate portion, which brake arms by spring action between said two plate portions can be turned to a braking position, in which the brake arms extend downwardly to a position below the ski, characterized in that the bottom plate consists of a single piece of thin sheet metal, which is provided with longitudinal deformation grooves extending between and into both plate portions in the longitudinal direction of the ski, the bottom plate in unloaded state is bent transversely to the longitudinal direction so that an angle is formed between the attachment plate portion and the thrust plate portion, that the bottom plate is elastically flexible against



its own resilience enabling it to be flexed to a substantially plane condition, and that the sheet metal material along said brake arms and extending between said brake arms across said thrust plate portion has a deformation contour providing stiffness in said thrust plate portion and said brake arms.

4,376,546

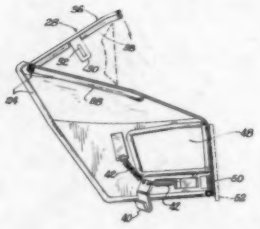
VEHICLE FRONT END SHIELD

Leo A. Guccione, Carlsbad, and David Millar, San Diego, both of Calif., assignors to Timothy Long, San Diego, Calif.

Continuation-in-part of Ser. No. 104,110, Dec. 17, 1979, abandoned. This application Apr. 3, 1981, Ser. No. 251,012

Int. Cl.³ B60R *27/00*

U.S. Cl. 280—770 **8 Claims**



1. A protective shield, for use on a vehicle front around the headlight area, said vehicle being of the type having retractable headlight mechanisms, each of said mechanisms defining a pair of oppositely directed lateral pilot holes, which comprises:

a rigid formed panel having cutouts for the vehicle headlights;

said panel being shaped to conform to the front of the vehicle around the headlight area;

a soft spacer bead lining the periphery of said panel to space said panel from the surface of said vehicle to which said shield is applied;

means for attaching said panel to the vehicle;

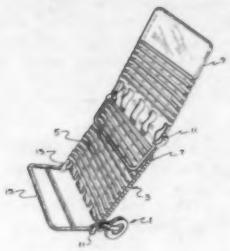
a pair of headlight covers dimensioned to substantially span said cutouts; and

means gripping the respective headlight mechanisms to retain said covers in place comprising depending slotted flanges engaged on said holes by screws passing through the respective slots in said flanges.

4,376,547
LOUNGE CHAIR CONVERTIBLE WHEELS

Joseph S. Dominko, Poverty Hollow Rd., Newtown, Conn. 06470

Filed Nov. 12, 1980, Ser. No. 206,090
Int. Cl.³ A47C 13/00; B62B 1/00
U.S. Cl. 280—30 2 Claims

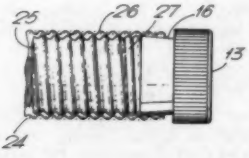


1. Lounge chair convertible wheels comprising a three-section folding tubular framed chair assembly with hinging means at each section junction with the other sections, each of said hinging means having a position locking means, with folding leg assemblies attached to the center section of said three section chair and at least two moveable and removeable wheel and clamp assemblies for clamping said wheel and clamp assemblies to the tubular frames and folding legs of said chair assembly; said moveable and removeable wheel and clamp assembly comprising sections so formed as to have two clamp sections, each said clamp section shaped to fit over the frame of two of the sections of said chair assembly, and over the shape of the folding legs, at least one wheel axle assembly, retaining means between the clamp section and the wheel axle assembly to keep said side sections from separating or rotating about the axle, and clamping means to draw each said side member together as a clamp.

4,376,548
END FITTINGS FOR CONDUITS

Kenneth W. Armstrong, 'Curylgates', 150 Ambleside Rd., Lightwater, Surrey, England

Filed Dec. 5, 1980, Ser. No. 213,761
Claims priority, application United Kingdom, Dec. 6, 1979, 7942127
Int. Cl.³ F16L 33/20
U.S. Cl. 285—149 4 Claims



1. An end fitting for a conduit of the kind having a convoluted tube and an outer reinforcing sheath comprising,

a tubular member having a first portion adjacent one end thereof that includes means for co-operating with the convoluted tube of said conduit to facilitate screwing of the first portion into the bore of said convoluted tube,

a second portion remote from the said one end of the tubular member defining a frusto-conical surface which gradually tapers inwardly away from the said one end and which is to receive the outer sheath of the conduit therearound,

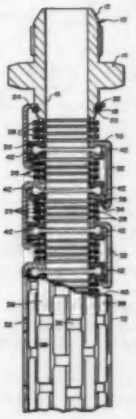
a third portion intermediate said first and second portions which defines a generally plain cylindrical surface of less overall diameter than the first and second portions around which convolutions of the convoluted tube of the conduit adjacent its end are to be received and a radially-extending shoulder adjacent the second portion against which the end of the convoluted tube is to abut,

and means for clamping the sheath against the said tapered frusto-conical surface of the second portion, said clamping means comprising an annulus which extends around the tapered frusto-conical surface of the second portion of the said tubular body and which is deformable so as to reduce its internal diameter and conform with said frusto-conical surface, thereby to clamp the sheath of the conduit against the frusto-conical surface.

4,376,549
MECHANICAL MUSCLE ELEMENT

Howard W. Cole, 12 Vale Dr., Mountain Lakes, N.J. 07046

Filed Jul. 30, 1980, Ser. No. 173,689
Int. Cl.³ F16L 27/00
U.S. Cl. 285—114 5 Claims



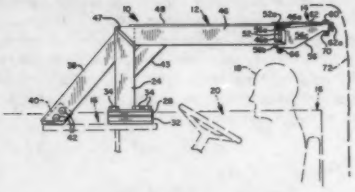
1. A mechanical muscle element, comprising an axially flexible convoluted circular tube having axially clustered pluralities of convolutions of first cross-sectional area between axially spaced convolutions of second cross-sectional area larger than said first area, first category rings in the spaces between first-area convolutions and radially inwardly confining the involved cluster of convolutions, second category rings in the spaces between each second-area convolution and the adjacent first-area convolution and radially inwardly confining the tube in each such space, first axially stiff interconnections between those second-category rings which enable said first interconnections to span at least two second-area convolutions and the cluster of first-area convolutions therebetween, and second axially stiff interconnections between those second-category rings which enable said second interconnections to span at least two second-area convolutions and the cluster of first-area convolutions therebetween, said first and second interconnections being in axial overlapping relation with opposite axial sides of the same second-area convolution, the effective sectional area of second-area convolutions being other than twice the effective sectional area of first-area convolutions, whereby changes in internal fluid pressure within said tube will induce related differential forces in a predetermined direction of change in the relative axial positioning of said first and second interconnections.

4,376,550

VEHICLE CANOPY

J. Gerrold Strauss, Portland, Oreg., assignor to PACCAR Inc., Bellevue, Wash.

Filed Jun. 1, 1981, Ser. No. 268,679
Int. Cl.³ B62D *25/06*
U.S. Cl. 296—102 10 Claims



1. An impact-absorbing canopy for covering the operating station of a vehicle, wherein the canopy comprises:

a main section having support means extending over the operating station, with first and second longitudinally-spaced pivot means mounted to said support means;

an impact section having first and second pivot arms pivotally mounted to and extending laterally from said first and second pivot means, respectively, said first and second pivot arms including first and second pivotal cover mounting means, respectively; and

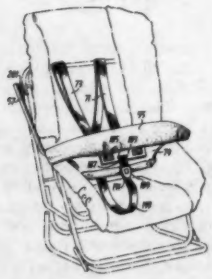
an impact section cover plate pivotally mounted to said first and second pivotal cover mounting means, positioned above in concealing relation with said first and second pivot arms and said first and second pivot means so that said impact section cover plate is pivotable in a fore-and-aft direction.

4,376,551

CHILD CARE SEAT AND RESTRAINING SYSTEM

Richard E. Cone, Dayton, Ohio, assignor to Questor Corporation, Tampa, Fla.

Continuation-in-part of Ser. No. 135,933, Mar. 31, 1980, Pat. No. 4,343,510. This application Jul. 18, 1980, Ser. No. 170,174
Int. Cl.³ A47D *13/08*
U.S. Cl. 297—250 4 Claims



1. In a child's car seat including an adjustable frame and a unitary seat and back structure, an improved restraining apparatus comprising

a U-shaped member pivotally mounted at its terminal ends to opposite sides of the upper portion of said frame so as to be movable between positions above the occupant and in front of the occupant;

a padded shield mounted about the bight of said U-shaped member;

a harness having two shoulder straps and a crotch strap joined together at one of the ends of each of said straps;

a plurality of slots in said back structure, the other ends of each of said shoulder straps passing through preselected individual slots and forward of said back structure;

a slot in said seat structure, the other end of said crotch strap passing under the seat structure and upwardly through said slot in said seat structure;

means secured to the underside of said shield for adjustably retaining the other ends of said shoulder straps, said straps passing under the inner edge of said shield;

releasable latching means for securing the other end of said crotch strap to said underside of said shield; and

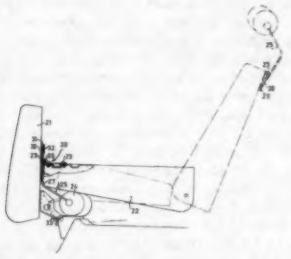
spring means connected between said frame and said U-shaped member for biasing said member to said position above the occupant.

4,376,552

BACK SEAT HEADREST

Stig T. L. Pilhall, Trollhättan, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Feb. 3, 1981, Ser. No. 231,154
Claims priority, application Sweden, Feb. 15, 1980, 8001219
Int. Cl.³ A47C *1/10*
U.S. Cl. 297—391 5 Claims



1. A back seat for a station wagon, comprising a seat bottom which can be swung between a substantially horizontal position and an essentially vertical position, in which latter position the underside of the seat bottom forms the front limitation of a cargo space, and a seat back, hinged at its lower edge and which can be swung between an upright position and a forwardly directed, substantially horizontal position, in which latter position the back of the seat back forms a cargo carrying surface, said seat back has on its back mounting means for a support for a headrest, means to fix the support in a first position in which the headrest is disposed above the upper edge of the seat back, and to permit folding the support forward from said first position to a second position in which the headrest is disposed beneath the seat back when the seat back is in the forwardly folded substantially horizontal position.

4,376,553

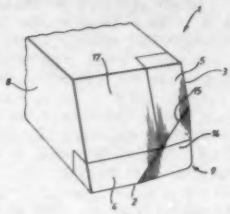
FLOOR CUTTER BIT

Oswald Breuer, Dortmund-Hussen, and Gerhard Merten, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,257
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005110
Int. Cl.³ E21C *27/44*
U.S. Cl. 299—34 9 Claims

1. A floor cutter bit for a coal plough, comprising: a body member (8), a floor cutter plate (4) and a single coal-face cutter plate (5), each of the cutter plates having a respective cutting edge (2,3), and each of the cutter plates being mounted within a respective aperture (6,7) in the body member, the cutting edge of the floor cutter plate extending the entire length of the floor cutter plate, the floor cutter plate extending over the

entire width of the body member, and a base of the coal-face cutter plate adjoining an upper side of the floor cutter plate on



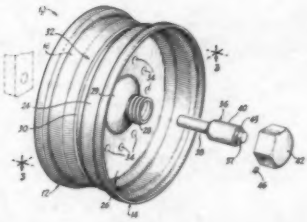
a side thereof in a direction of lateral advance in use to define therewith an L-shaped cutter plate configuration.

4,376,554

IMPLEMENT WHEEL

William G. Schumacher, Elgin, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Jan. 26, 1981, Ser. No. 228,042
Int. Cl.³ B60B 1/06
U.S. Cl. 301—63 DD **4 Claims**



1. An implement wheel comprising:
a first wheel half having an outer annular rim with a valley portion and having an integral interior wall shaped at its center to define a frusto-conical surface whose truncated end provides an annular bearing seat and whose conical surface merges into the circular plate portion of said interior wall;
a second wheel half having an outer annular rim with a valley portion, an integral interior wall portion shaped at its center to define a conical surface having an angle of inclination equal to the angle of inclination of the conical surface of said first wheel half, and an axially extending nipple;
said first and second wheel halves being secured together by a weld in said valley portion;
a bearing having one end installed in said bearing seat; and
a bearing engagement member threadedly secured to said nipple for engaging the other end of said bearing and holding said bearing in said bearing seat.

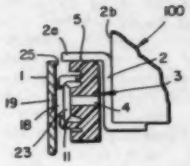
4,376,555

DRAWER SUPPORT AND/OR GUIDE ROLLER WITH AXIAL BEARING PIN

Alfred Grass, Konsumstrasse 20, A-6973 Hochst/Vlbg., Austria

Filed Aug. 25, 1980, Ser. No. 180,784
Claims priority, application Austria, Aug. 31, 1979, 5798/79
Int. Cl.³ F16C 29/00
U.S. Cl. 308—3.8 **10 Claims**

1. Support and guide roller adapted to be mounted on an axial bearing pin of relatively small diameter for drawers, comprising:
A. a body portion fabricated from a plastic material with a relatively large outer diameter which when mounted on said pin forms a load-transmitting bearing both in the radial and in the axial direction thereof,
B. coupling means for detachably securing the support and guide roller to said pin,
C. said coupling means formed of concentrically arranged spring-elastic claws, each one of said claws adapted to be detachably connected in a force-locking manner with said pin, so as to obtain a securing of the support and guide roller with respect to axial displacement while guiding a drawer as movement thereof occurs relative to said pin,



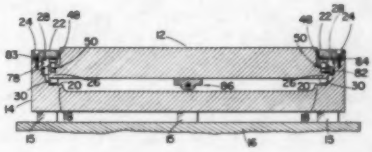
D. said claws are divided by radially directed slits into a number of segments and are molded of one piece with the support and guide roller, and said slits are sufficiently sized to ensure that said claws can be flexed to engage said pin, and
E. said axial bearing pin having a bearing shaft and a rivet pin at opposite ends thereof with a pair of adjacent collars of greater diameter than said bearing shaft and said rivet pin, said adjacent collars being disposed between said bearing shaft and said rivet pin.

4,376,556

LINEAR BEARING ARRANGEMENT

Raymond A. Bergman, 107 E. Second St., and Donald J. Hemmelgarn, 123 N. Garfield, both of Minster, Ohio 45865

Filed Sep. 2, 1980, Ser. No. 183,019
Int. Cl.³ F16C 29/06
U.S. Cl. 308—6 C **24 Claims**



1. A bearing arrangement comprising:
a first support element,
a second support element spaced from and generally opposite said first element,
an intermediate element interposed between said first and second support elements and moveable relative to said support elements,
one of said first support element and said intermediate element having a first guide surface facing the other of said first support element and said intermediate element, said first guide surface being formed to run extremely true to the desired path of movement of the intermediate element relative to the support elements, one of said second support element and said intermediate element having a second guide surface facing the other of said second support element and said intermediate element,
a first antifriction bearing means comprising rotatable bearing elements connected to the other of said first support element and said intermediate element and in movable

engagement with said first guide surface in directions parallel to said first guide surface,

a second antifriction bearing means comprising rotatable bearing elements connected to the other of said second support element and said intermediate element and in movable engagement with said second guide surface in directions parallel to said second guide surface, and

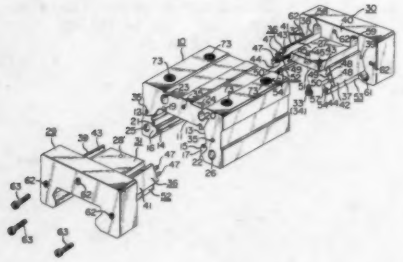
preload means on the opposite side of said intermediate element as said first guide surface for exerting pressure along a preload direction thereby yieldably pressing said second bearing means and said second guide surface together, said preload means including an expansible chamber device connected between said second bearing means and said the other of said second support element and said intermediate element such that expansion of the expansible chamber device presses said second bearing means and said second guide surface together thereby exerting a reaction force on said the other of said first support element and said intermediate element urging it toward the first guide surface, and means for supplying pressurized fluid to said expansible chamber device, said first bearing means being substantially immovably and non-yieldably supported by the other of said first support element and said intermediate element against movement relative thereto along the direction of the preload pressure when preload pressure is applied, there being preload means only on the side of said intermediate element opposite said true guide surface.

4,376,557

LINEAR BALL BEARING

Hiroshi Terumachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo, Japan (158)

Filed Nov. 30, 1981, Ser. No. 325,649
Claims priority, application Japan, Feb. 23, 1981, 56-24358
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **4 Claims**



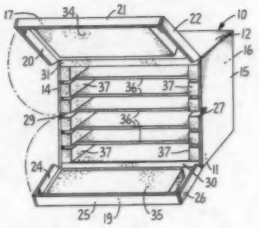
1. A linear ball bearing comprising a bearing casing and a pair of retainer and side cover assemblies which have a symmetrical configuration and are secured to the end face of said bearing casing, said bearing casing having four lines of loading ball guiding grooves formed on an upper wall and inclined side walls of a considerably large recess having a substantially trapezoidal cross-sectional configuration and four lines of non-loading ball guiding holes drilled through the bearing casing in the longitudinal direction located at a predetermined distance radially from said loading ball guiding grooves and in parallel to the loading ball guiding grooves, said loading ball guiding grooves and non-loading ball guiding holes having the substantially same radius of curvature as the diameter of a plurality of rolling balls located in the ball guides, while said retainer and side cover assemblies. comprising a retainer half and a side cover respectively, characterized in that the side cover has four lines of U-shaped ball movement direction reversing grooves formed on an inner end face thereof, said U-shaped ball movement direction reversing grooves being located corresponding to the loading ball guiding grooves and non-loading ball guiding holes, said retainer half containing a horizontal member, inclined members and lower holding members each of which is protruded from the end face of the side cover toward those of the opposite retainer half in such a manner that the U-shaped ball movement direction reversing grooves radially extend intermediate to the adjacent members, wherein the horizontal member, inclined members and lower holding members of the respective retainer halves have concave end faces so as to form four lines of loading ball guides therebetween of which inner diameter is substantially the same as the diameter of the rolling balls and which include means for preventing any falling-down of the loading balls therefrom, the respective retainer halves are dimensioned exactly to one half of the length of the bearing casing, one of the inclined members and lower holding members has engagement pins at their end faces, and the end faces of the opposite inclined member having engagement holes to receive the corresponding engagement pins therein.

4,376,558

THERMAL RETENTION CONTAINER

Beverly Bandar, 5 Scotts Ct., Scotts Valley, Calif. 95066

Filed Mar. 25, 1981, Ser. No. 247,371
Int. Cl.³ A47B *43/00*; B65D *90/04*
U.S. Cl. 312—259 **7 Claims**



1. A disposable thermal retention container for edibles comprising:

(a) an exterior housing of cardboard having a bottom wall, opposite side walls and top and rear walls defining an open front shell,

(b) two rectangular front closing panels hinged to the front edges of two opposite walls, said panels each having flanges perpendicular to their surface on their three nonhinged edges, the front edges of the remaining two walls having notches to admit and engage the flanges on the closing panels in their closed position,

(c) flat plastic foam inner panels corresponding in size to and affixed to the inner surfaces of the bottom wall, top and rear walls and front closing panels, and

(d) a plurality of removable cardboard shelves held in spaced alignment parallel to said bottom wall by a plurality of pairs of plastic foam spacing means located on the inner surfaces of the opposite side walls.

4,376,559

DUPLEX GROUNDING

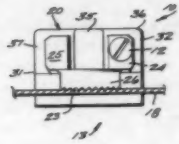
John C. Instone, Jr., Somerdale, N.J., assignor to SGL Industries, Inc., Haddonfield, N.J.

Filed Nov. 10, 1980, Ser. No. 205,517
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **10 Claims**

1. A receptacle comprising a housing having hot and neutral wire receiving structures associated therewith and a ground screw provided at one end thereof, wherein the improvement comprises:

means associated with said ground screw for grounding the

receptacle, said means comprising a grounding plate abutting said housing and having means defining an opening therein for receipt of said ground screw, and having a contoured surface extending away from said opening and for operatively engaging a ground object;



said receptacle comprising a face having an accessible operative component associated therewith, and a back; and

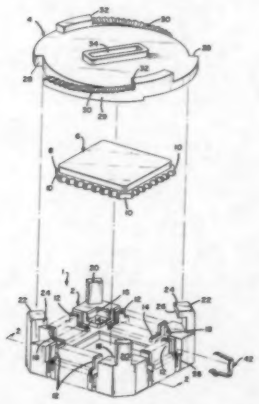
said contoured surface comprising an arm extending outwardly from said receptacle back substantially perpendicular thereto, and having a ground wire-receiving surface manifestation formed thereon.

4,376,560

SOCKET FOR A CERAMIC CHIP CARRIER

Billy E. Olsson, New Cumberland; James R. Kunkle, Enola, and Lit-Yan Kam, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1980, Ser. No. 216,727
Int. Cl.³ H01R *13/639*
U.S. Cl. 339—17 CF **7 Claims**



1. A socket for a chip carrier, comprising:

a base,

electrical contacts mounted on said base for engaging a circuit board,

insulative partitions on said base separating said contacts and providing a seat for said carrier,

projecting posts on said base having undercut inclined flanges,

a lid for clamping said carrier against said partitions and having inclined wedge ridges on which are friction surfaces contructed to engage said flanges,

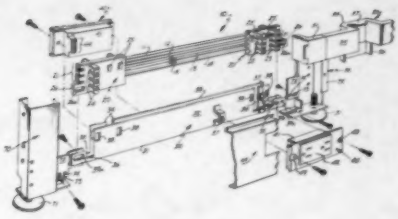
said contacts engaging said carrier and being resiliently deflected into spaces between said partitions upon said carriers being clamped against said partitions.

4,376,561

PANEL WIRING SYSTEM

Harold L. Vanden Hoek, Grand Rapids; Larry A. Speet, Holland, and Robert G. Mohr, Grand Rapids, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 909,975, May 26, 1978, Pat. No. 4,203,639. This application Sep. 27, 1979, Ser. No. 79,490
Int. Cl.³ H01R *13/64*
U.S. Cl. 339—21 R **5 Claims**



1. In a panel system comprised of at least two free standing movable room divider panels having enclosed electrical wiring, the improvement comprising: each of said panels having opposite end edges with first wiring means defining a first circuit extending generally from one end edge of said panel to the other end edge of said panel; second wiring means defining a second circuit extending generally from one end edge of said panel to the other end edge of said panel; at least one connector mounted in each of said panels, and including first and second sets of quick disconnect terminals; said first set of quick disconnect terminals having a configuration which is not that of a conventional plug receptacle, and being electrically connected to both said first and second wiring means to facilitate electrical connection of both the first and second circuits in one panel to those in another panel; panel power connector means joining said first set of quick disconnector terminals on one panel to said first set of quick disconnector terminals on the other panel; said second set of quick disconnect terminals having a configuration which is not that of a conventional plug receptacle, and having a plurality of terminals arranged into first and second groups; said first group being electrically connected to said first wiring means, and said second group being electrically connected to said second wiring means; a first conventional plug receptacle mounted on at least one of said panels, and having a set of quick disconnect terminals shaped for physical connection with said second set of quick disconnect terminals, and electrically mating only with said second group of terminals, whereby said first conventional plug receptacle can be electrically connected only to said second wiring means; a second conventional plug receptacle having a set of quick disconnect terminals shaped for physical connection with said second set of quick disconnect terminals, and electrically mating only with said first group of terminals, whereby said second conventional receptacle can be connected only to said first wiring means, yet whereby both said first and second conventional receptacles physically connect to said second set of quick disconnect terminals.

4,376,562

CAM ACTUATED SOCKET FOR ELECTRICAL LEADS

Robert C. Kaley, Landisville, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 19, 1981, Ser. No. 226,264
Int. Cl.³ H01R *13/639*
U.S. Cl. 339—75 M **6 Claims**

1. A socket for DIP leads comprising:

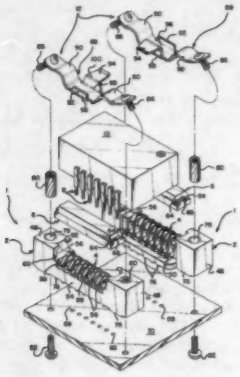
an insulative base provided with a seat for a DIP device and a series of partition walls,

a row of electrical terminals mounted on said base separated from one another by said partition walls, said terminals

having resilient, spring contact portions initially projecting above said partition walls, and receptacle portions depending from said base defining electrical leads,

a pair of end walls on said base projecting above said partition walls,

a cam extending between said end walls initially supported on said contact portions and outwardly away from said partition walls,



said cam being constructed for displacement toward and registration against said partition walls deflecting resiliently said central portions in directions across the axes of respective said receptacle portions, and

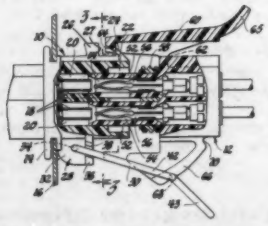
means secured on said base for actuating said cam toward and against said partition walls and for defining between said means and said seat a receiving space for a DIP device.

4,376,563

ELECTRICAL CONNECTOR WITH MECHANICALLY ASSISTED LATCH MEANS

Shawn G. Margrave, Warren, Ohio, and Donald L. Nordeen, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1981, Ser. No. 246,079
Int. Cl.³ H01R *13/627*
U.S. Cl. 339—91 R 2 Claims



1. In an electrical connector having matable dielectric connector bodies which include means for latching the connector bodies in mating engagement,

the combination comprising,

a pair of longitudinally spaced catches on one side of one of said connector bodies,

a bail wire pivotally mounted on an opposite side of the one connector body, said bail wire being pivotally mounted on said connector body at one end and having a handle at its opposite end,

a latch arm pivotally attached at its middle to one side of the other connector body, said latch arm having a latch at one end and a handle at the other end,

a projecting cam on the opposite side of said other connector body, said projecting cam having a pair of longitudinally spaced notches,

said bail wire snap engaging a forward one of the notches of the projecting cam and said latch arm snap engaging a forward one of the catches when said connector bodies are partially mated to retain the connector bodies in a preliminary latched position where the handles of the bail wire and the latch arm are moveable toward each other with one hand,

said connector bodies being mechanically assisted to a fully mated position by the bail wire riding down the projecting cam when said handles are moved toward each other, and

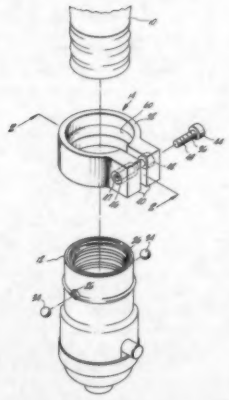
said bail wire engaging a rearward one of the notches in the projecting cam and the latch arm engaging a rearward one of the catches to latch the connector bodies in the fully mated position.

4,376,564

LIGHTBULB LOCK

Kenneth B. Kilbourne, 1548 Lisa, P.O. Box 813, Carpinteria, Calif. 93013

Filed Sep. 8, 1980, Ser. No. 184,776
Int. Cl.³ H01R *13/20*
U.S. Cl. 339—92 R 15 Claims



1. An apparatus for locking lightbulbs in their holders and to prevent lightbulbs from being pilfered comprising:

(a) at least one polymeric, electrically non-conductive locking insert sized to project through a hole in the wall of the holder and engage the base of a lightbulb mounted therein;

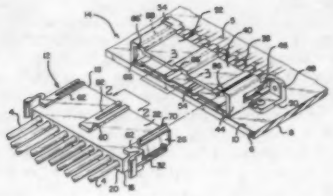
(b) an electrically non-conductive band adapted to encircle the holder over the insert, the band having an inner surface engaging the holder, the inner surface being sufficiently large to completely cover the insert; and

(c) means for tightening the band around the holder with the insert placed in the hole in the holder for forcing the insert into sufficiently tight engagement with the base of the lightbulb that the bulb cannot be removed from the holder without releasing the tightening means.

4,376,565
ELECTRICAL CONNECTOR KEYING MEANS

Philip S. Bird, Lancaster, and Christopher J. O'Neill, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 17, 1981, Ser. No. 234,299
Int. Cl.³ H01R 13/645
U.S. Cl. 339—186 M 3 Claims



1. An electrical connector assembly having improved keying means, said connector assembly comprising a plug part and a receptacle part, each of said parts comprising a housing having at least one electrical contact terminal therein, said housings each having a mating face, said mating faces being opposed to each other when said parts are coupled, said receptacle part having a hood which surrounds, and extends forwardly from, said mating face of said receptacle part, said hood having a leading edge which is spaced from said mating face of said receptacle part, said plug part having forward portions which are received in said hood when said parts are coupled, said connector assembly being characterized in that:

said hood has at least two latent slots therein extending axially from said leading edge towards said mating face of said receptacle part, each of said latent slots comprising thin-walled portions of said hood which have a wall thickness which permits easy removal thereof with resulting formation of an actual slot,

at least two key-receiving groove means on said forward portions of said plug part, said groove means being in alignment with said latent slots when said parts are coupled, said groove means extending from said mating face of said plug part across said forward portions of said plug part,

said groove means and an actual slot formed from one of said latent slots having cross sections which are substantially identical,

at least one key which has a uniform cross section along its length, said key having a first axially extending portion which is dimensioned to be permanently placed in either one of said groove means or in an actual slot formed from one of said latent slots, said key having a second axially extending portion which is dimensioned to be freely received in an actual slot when said key is placed in one of said groove means whereby,

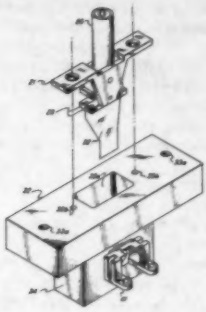
said plug part and said receptacle part can be keyed to each other by forming an actual slot in said receptacle part and placing a key in the corresponding groove means in said plug part, and the keying can be later changed by placing a key in the actual slot in the receptacle part.

4,376,566
FIBER OPTIC SWITCHING METHOD AND APPARATUS WITH FLEXIBLE SHUTTER

Paul A. Blackington, Vandling, Pa., assignor to Sheltered Workshop for the Disabled, Inc., Binghamton, N.Y.

Continuation-in-part of Ser. No. 126,178, Mar. 3, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,531
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.2 12 Claims

1. Apparatus for selectively establishing and preventing light transmission between first and second optical fibers, comprising, in combination: a support member having first and second recesses adapted to receive respective optic fiber connectors to fixedly space the ends of said fibers in axial and angular alignment with each other and with an air space between the ends of said fibers; an opaque flexible planar shutter having a thickness less than the width of said air space; means for moving said shutter between a first position in which a portion of said

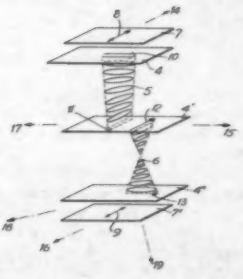


shutter completely intersects said air space between the ends of said fibers to prevent light transmission between said ends and a second position in which no portion of said shutter is interposed in said air space; and means for constraining movement of said portion of said shutter to a plane substantially perpendicular to the axes of said fibers.

4,376,567
LIQUID CRYSTAL DISPLAY DEVICE

Shunji Banda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 81,403, Oct. 3, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,746
Claims priority, application Japan, Oct. 3, 1978, 53-12267
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.
Int. Cl.³ G02F 1/133
U.S. Cl. 350—335 21 Claims



1. A liquid crystal display device comprising:

a first upper liquid crystal display cell including an upper and an opposed lower transparent plate, the interior surface of said plates having been treated for aligning the long axis of a liquid crystal molecule in an aligned direction, said interior surfaces having transparent electrode means disposed thereon for forming characters aligned in a reference direction between the 12 and 6 o'clock direction when viewed from the 6 o'clock direction and a twisted nematic liquid crystal material disposed between said plates;

a second lower liquid crystal display cell, sequentially ar-

ranged with respect to said first cell, including an upper and an opposed lower transparent plate, the interior surfaces of said plates having been treated for aligning the long axis of a liquid crystal molecule in an aligned direction and having transparent electrode means disposed thereon for forming characters aligned in said 12 and 6 o'clock reference direction and a twisted nematic liquid crystal material disposed between said plates;

the aligned directions of each plate and the long axes of the liquid crystal molecules adjacent each plate in each cell disposed at 90° angles to each other and the lower plate of the upper cell and the upper plate of the lower cell unidirectionally aligned in the same direction;

an upper polarizing plate having an axis of polarization in a first polarizing direction on the outer surface of said first cell; and

a lower polarizing plate having an axis of polarization in a second polarizing direction which is substantially parallel to the first polarizing direction on the lower surface of said second cell;

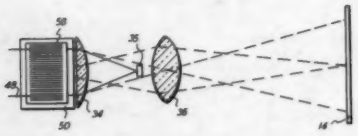
whereby improved contrast in the display formed by said characters is obtained in both the upper and lower cells when observed between the four-thirty and seven-thirty directions.

4,376,568

THICK FILM LINE MODULATOR

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1981, Ser. No. 224,244
Int. Cl.³ G02F *1/03*
U.S. Cl. 350—356 **5 Claims**



1. In an electro-optic printer having a multi-gate light valve (12) for phase front or polarization modulating a sheet-like collimated light beam (124) in accordance with input data samples of finite duration representing individual picture elements of an image, and phase or polarization sensitive optics (34) for imaging the modulated light beam onto a photosensitive recording medium (14) as said recording medium advances in a cross-line direction relative to said light-valve, whereby said recording medium is exposed in an image configuration, wherein the improvement is characterized by:

said light valve comprising a substrate (130) containing an optically transmissive electro-optic film (212), drive electrodes (240) in the form of a plurality of individually addressable electrodes formed on the substrate (230) between the substrate and said electro-optic film (212), a broad electrode (242) on the opposite surface of said electro-optic film (212) from the drive electrodes (240) such that when said light beam (124) is focused into said electro-optic film (212) at one end thereof said light passes between said drive electrodes (24) and said broad electrode (242), said individually addressable electrodes (240) creating parallel electric fields within said electro-optic film to phase front modulate said light beam.

4,376,569

ELECTROLYTE FOR AN ELECTROCHROMIC DISPLAY

John A. Baritrop, Oxford; Colin L. Bird, Eastleigh, and Gilbert C. S. Collins, Southampton, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1980, Ser. No. 146,824
Claims priority, application United Kingdom, May 23, 1979, 7917883
Int. Cl.³ G02F *1/17*; C09K *3/00*
U.S. Cl. 350—357 **12 Claims**

1. An electrolyte for an electrochromic display of the kind in which a persistent colored species of an electrochromic substance in solution is deposited onto a display electrode upon the passage of current therethrough, the electrolyte comprising an electrochromic di-alkyl bipyridinium salt and a non-polymeric monohydric aliphatic alcohol, both in aqueous solution, taken from the group consisting of a and b where

(a) both alkyl groups of the bipyridinium salt have seven carbon atoms and the alcohol has and even number of carbon atoms; and

(b) both alkyl groups of the bipyridinium salt have six carbon atoms and the alcohol has an odd number of carbon atoms.

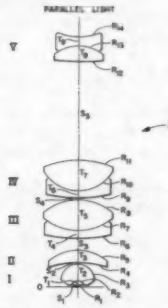
12. An electrochromic display cell comprising an array of display electrodes, a counter electrode and an electrolyte as claimed in claim 1.

4,376,570

MICROSCOPE OBJECTIVE

Milton H. Sussman, Amherst, N.Y., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Mar. 16, 1981, Ser. No. 243,979
Int. Cl.³ G02B *21/02*
U.S. Cl. 350—414 **2 Claims**



1. A five-component microscope objective having an N.A. of 1.25 comprising a plano-convex doublet I, a concavo-convex singlet II, a biconvex doublet III, a biconvex doublet IV and a convex-concavo doublet V having the following parameters:

Lens	Radius (R)	Thickness (T)	Spacing (S)
			$S_1 = 0.148f$
	$R_1 = \infty$		
		$T_1 = 0.313f$	
I	$R_2 = -0.583f$		
		$T_2 = 1.469f$	
	$R_3 = -1.356f$		
			$S_2 = 0.011f$
	$R_4 = -7.791f$		
II		$T_3 = 1.096f$	
	$R_5 = -3.448f$		
			$S_3 = 0.872f$
	$R_6 = 7.582f$		
		$T_4 = 0.658f$	
III	$R_7 = 4.404f$		

-continued

		$T_5 = 2.632f$
	$R_8 = -4.404f$	
		$S_4 = 0.027f$
	$R_9 = 12.084f$	
		$T_6 = 0.658f$
IV	$R_{10} = 3.284f$	
		$T_7 = 2.522f$
	$R_{11} = -9.956f$	
		$S_5 = 8.728f$
	$R_{12} = 78.162f$	
		$T_8 = 1.371f$
V	$R_{13} = -3.448f$	
		$T_9 = 0.828f$
	$R_{14} = 4.342f$	

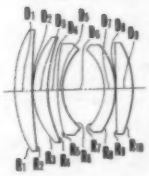
Lens	Refractive Index (ND)	Abbe No (ν)
	$1.53 < ND_1 < 1.55$	$50 < \nu_1 < 52$
I		
	$1.87 < ND_2 < 1.89$	$40 < \nu_2 < 42$
II	$1.78 < ND_3 < 1.80$	$46.5 < \nu_3 < 48.5$
	$1.77 < ND_4 < 1.79$	$25 < \nu_4 < 27$
III		
	$1.43 < ND_5 < 1.45$	$94.5 < \nu_5 < 96.5$
	$1.77 < ND_6 < 1.79$	$25 < \nu_6 < 27$
IV		
	$1.43 < ND_7 < 1.45$	$94.5 < \nu_7 < 96.5$
	$1.77 < ND_8 < 1.79$	$25 < \nu_8 < 27$
V		
	$1.60 < ND_9 < 1.62$	$43.5 < \nu_9 < 45.5$

wherein f = 1.8 to 1.85 mm.

4,376,571
PHOTOGRAPHIC SMALL SIZE OBJECTIVE

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 269,902
Claims priority, application Japan, Jun. 6, 1980, 55-76419
Int. Cl.³ G02B 9/60
U.S. Cl. 350—467 2 Claims



1. A photographic objective of small size consisting of five lens groups, each group having a single lens, including, from front to rear,

a meniscus 1st lens of positive power convex toward the front;

a meniscus 2nd lens of positive power convex toward the front;

a meniscus 3rd lens of negative power convex toward the front;

a meniscus 4th lens of negative power convex toward the rear; and

a 5th lens of positive power with its rear surface having a strong refractive power, and satisfying the following conditions:

$$0.04 < D_4/f < 0.06 \quad (1)$$

$$21.2 \leq \nu 2 - \nu 3 < 28 \quad (2)$$

$$0.29 < |\phi 1| \cdot f < 0.75, \ \phi 1 < 0 \quad (3)$$

where:

f is the focal length of the entire system;

Ni and νi are the refractive index and Abbe number of the i-th lens counting from the front respectively;

Di is the i-th lens thickness or air separation counting from the front;

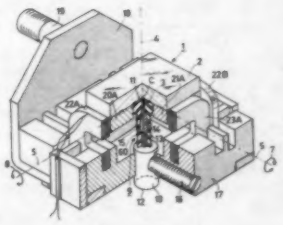
Ri is the radius of curvature of the i-th lens surface counting from the front; and

$$\phi 1 = (1 - N2)/R_4 + (N3 - 1)/R_5.$$

4,376,572
PIVOTING MIRROR DEVICE

Wilhelmus A. H. Gijzen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,419
Claims priority, application Netherlands, Oct. 30, 1980, 8005948
Int. Cl.³ G02B 27/17
U.S. Cl. 350—486 4 Claims



1. A pivoting mirror device for an apparatus which scans information tracks on an information carrier with the aid of a radiation beam, which device comprises:

a pivoting mirror (1) which is pivotable about at least one pivoting axis (5, 6) and which has a radiation-reflecting front (2) and, on the reverse side thereof, a back (3), and

a mirror bearing arrangement (9) comprising:

a rigid bearing support (10) having a first end (11) situated near the back (3) of the pivoting mirror and a second end (12) which is remote therefrom, and

an elastic bearing (13) of a rubber-like material which is connected both to the back (3) of the pivoting mirror (1) and to the bearing support (10), which material surrounds the first end of the bearing support and a portion (14) of the bearing support near the first end,

characterized in that said portion (14) of the bearing support (10) which is situated near the first end (11) has a cross-section which varies from a minimum transverse dimension at the first end (11) to a maximum transverse dimension at a location situated nearer the second end (15).

4,376,573
APPARATUS FOR MEASURING THE REFRACTIVE POWER OF THE EYE

Isao Matsumura, Yokosuka; Yasuyuki Ishikawa, Kawaguchi; Shigeo Maruyama, Machida; Reiji Hirano, and Yoshimi Kobayakawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

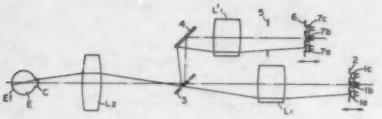
Filed Mar. 18, 1980, Ser. No. 131,499
Claims priority, application Japan, Mar. 20, 1979, 54-32628
Int. Cl.³ A61B 3/10
U.S. Cl. 351—212 22 Claims

1. An apparatus for measuring the refractive power of the eye comprising:

generating means for generating radiant energy;

a first optical system for directing said radiant energy to the eye to be examined, said first optical system having fixed optical means and first afocal optical means movable in the direction of the optic axis;

a second optical system for receiving the radiant energy reflected by the eye fundus of said eye, said second optical system having second afocal optical means movable in the direction of the optic axis;



detecting means for detecting the radiant energy passed through said second optical system;

coupling means for coupling said first optical system and said second optical system;

driving means for driving said first and second afocal optical means; and

position detecting means for detecting the position of one of said first and second afocal optical means on the optic axis.

4,376,574

CAMERA WITH ELECTRONICALLY CONTROLLED SHUTTER AND FLASH TRIGGERING ASSEMBLY

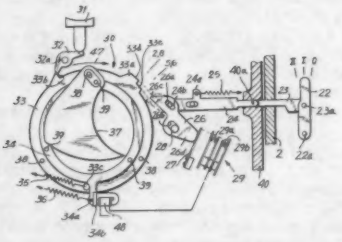
Karl-Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG, Bunde, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,419

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033453

Int. Cl.³ G03B *15/03*

U.S. Cl. 354—147 **13 Claims**



1. A camera having an electronically programmed shutter, wherein the shutter is operated by displacing an opening member for opening the shutter blades and rotating a closing member for closing the shutter blades, the camera adapted to receive an electronic flash device, comprising:

a projecting region formed on the opening member having at least one detent corresponding to a value of a lens opening;

switch means including circuit interruption means for releasing the shutter locking ring to initiate closing of the shutter;

a transfer member disposed between the opening member and the switch means, said transfer member displaceable into the locus of displacement of the at least one detent when the flash is mounted on the camera for displacing the transfer member towards the switch means upon contact by the detent on the rotating opening member for displacing the transfer member into contact with the switch means upon the shutter opening to the maximum lens opening, said switch means initiating rotation of the locking member for closing the shutter.

4,376,575

SINGLE LENS REFLEX CAMERAS AND VIEWFINDER DISPLAY SWITCHOVER DEVICES THEREFOR

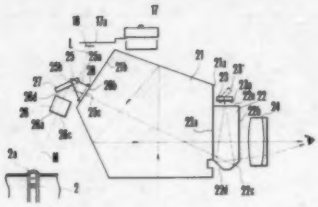
Hiromi Someya, Kawasaki, and Kikuo Momiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 319,068

Claims priority, application Japan, Dec. 26, 1980, 55-187747[U]

Int. Cl.³ G03B *13/02, 17/20*

U.S. Cl. 354—155 **10 Claims**



1. A finder display changeover device for a single lens reflex camera having a shutter dial and a pentaprism and an eyepiece, and which forms a viewfinder image of the camera's field of view and a data image near the viewfinder image through the eyepiece by passing data light from the vicinity of the pentaprism into the interior of the pentaprism, comprising:

(a) transmission means in the shutter dial for transmitting motion of the dial;

(b) response means in a position engageable with the transmission means to be actuated depending upon the selected position of the shutter dial; and

(c) display changeover means between the pentaprism and the eyepiece and actuated by the response means to control the direction of the data light to the eyepiece.

4,376,576

LIGHT COLLECTOR ROD FOR USE IN XEROGRAPHIC SYSTEMS

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1980, Ser. No. 183,120

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **5 Claims**

1. A light collector for use with a flying spot scanner adapted to raster scan images developed on the photoconductive surface of a xerographic type copying apparatus, said collector being disposable opposite said photoconductive surface to collect light reflected from said photoconductive surface when scanning images developed on said photoconductive surface, the improvement comprising:

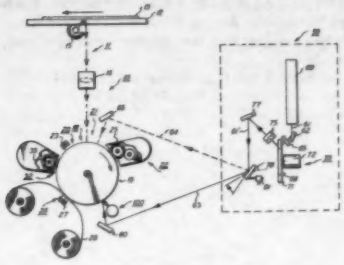
(a) a transparent central core;

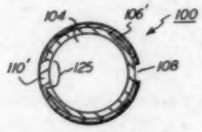
(b) a layer of cladding material covering the periphery of said core;

(c) a layer of light diffusing material covering the outer periphery of said cladding material except for a slit-like aperture through which light reflected from said photoconductive surface enters said core through said cladding material, said aperture extending in a direction substantially parallel to the axis of said core; and

(d) a photosensor at at least one end of said collector, said photosensor being operatively coupled to said collector to enable said photosensor to sense light transmitted axially along said core whereby to provide image signals representative of the image scanned,

light reflected from said photoconductive surface passing through said aperture and through said cladding material and said core to said light diffusing material, said light diffusing material diffusing said light and reflecting light back through said cladding material and into said





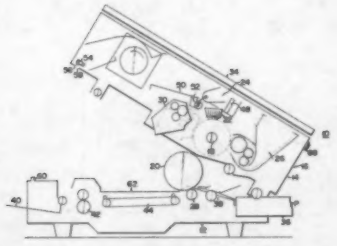
core, a portion of said diffused light being trapped in said cladding material between said core and said light diffusing material whereby to form a secondary diffusion, said light traveling by reflection axially along said core and said cladding material to said photosensor.

4,376,577

ELECTROSTATIC COPYING APPARATUS

Katsuhiko Okamoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1981, Ser. No. 237,947
Claims priority, application Japan, Feb. 29, 1980, 55-25116
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 DR **10 Claims**



1. In an electrostatic copying apparatus comprising:
- a housing including a lower housing section and an upper housing section mounted on the lower housing section and capable of swinging to open the lower housing section;
- a photosensitive drum provided in the upper housing section;
- a support mechanism attached to the upper housing section for supporting the photosensitive drum to allow the drum to be rotated and detached;
- a guide mechanism attached to the lower housing section for guiding the photosensitive drum to one end of the lower housing section after the drum has been detached from the supporting mechanism; and
- at least one peripheral device provided within the upper housing section, put in contact with the photosensitive drum during copying operation and moved away from the photosensitive drum to allow the drum to be detached from the support mechanism,

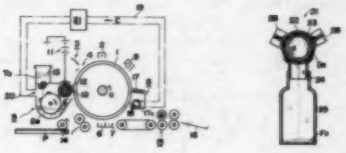
wherein said upper housing section is swung open to allow said photosensitive drum to be taken from said housing, the improvement which includes:
- a detect switch which is attached to the housing and which is closed by a specific operation necessary for taking the photosensitive drum from the housing; and
- a light source which is provided within the housing for illuminating the outer periphery of the photosensitive drum and which is turned on when said detect switch is closed.

4,376,578

ELECTROGRAPHIC COPYING MACHINE OF POWDER IMAGE TRANSFER TYPE

Susumu Tanaka, and Tateki Oka, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1981, Ser. No. 307,661
Claims priority, application Japan, Oct. 7, 1980, 55-140790
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **5 Claims**



1. A powder image transfer type electrographic copying machine which comprises:

an image bearing member;

a magnetic brush developing unit having a developing electrode in its interior and a magnetic developer which is a mixture of a finely divided substantially non-magnetic toner having insulating properties and a finely divided magnetic carrier having particles of a size sufficiently small to be transferable to the image bearing member with the toner and a resistivity of at least 10^{13} ohm-cm for developing a latent electrostatic image on the surface of the image bearing member, said toner being of a type which is triboelectrically charged with a polarity opposite to that of the latent electrostatic when brought into frictional contact with said magnetic carrier;

a developing bias voltage source for applying to the developing electrode a developing bias voltage sufficient for electrostatically depositing the magnetic carrier of the magnetic developer on the surface of the image bearing member in the background area of the latent electrostatic image during the development of the latent image;

a toner image transfer unit for selectively transferring to the surface of a copy sheet only the insulating toner adhering to the surface of the image bearing member in corresponding relation to the image area of the latent image and contained in the magnetic developer electrostatically deposited on the surface of the image bearing member by the development of the latent image;

a cleaner for removing and recovering from the surface of the image bearing member the magnetic developer remaining on the surface after the transfer of the insulating toner;

a nonmagnetic hollow cylindrical member extending from said cleaner to said magnetic brush developing unit for transporting the magnetic developer recovered by the

cleaner into the magnetic brush developing unit and having at least a portion thereof disposed in an approximately horizontal position;

the lower wall of the approximately horizontal portion of the hollow cylindrical member having a foreign matter removal opening therein;

a magnetic transport member disposed within said hollow cylindrical member for moving the magnetic developer through said hollow cylindrical member toward the developing unit; and

a magnet means structurally associated with said cylindrical member for forming a magnetic field in said cylindrical member for attracting the magnetic carrier contained in the portion of the magnetic developer located in the vicinity of the removal opening upwardly in the hollow cylindrical member;

whereby the course of transporting the magnetic developer recovered by the cleaner toward the developing unit, foreign matter in the magnetic developer is caused to fall through the opening.

4,376,579

ELECTROSTATIC COPYING APPARATUS HAVING AN EASILY REMOVABLE PHOTOSENSITIVE DRUM

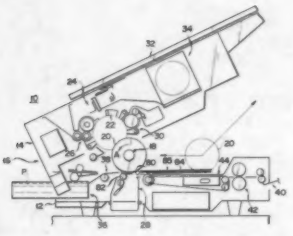
Nobutaka Wakao, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

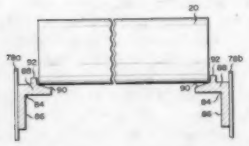
Filed Feb. 26, 1981, Ser. No. 238,652

Claims priority, application Japan, Feb. 29, 1980, 55-25103

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DR **13 Claims**





1. An electrostatic copying apparatus comprising:

a casing including a lower casing section and an upper casing section pivotably connected to one end of said lower casing section for movement between an open position and a closed position;

a photosensitive drum;

support means attached to said upper casing section for releasably supporting said photosensitive drum in said upper casing section; and

guide means attached to said lower casing section and extending between a first position under said support mechanism on one side of said casing and a second position at an end of said casing on a side opposite said one side, for guiding said photosensitive drum after removal from said support means between said first and second positions, said guide means including a pair of rails each continuously extending between a position adjacent to said first position and said second position, said rails having guide surfaces inclined relatively to the rotating axis of said photosensitive drum, said guide surfaces being in point-contact with the bottom edges of the end faces of said photosensitive drum to support said drum.

4,376,580

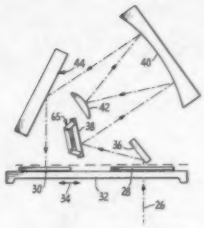
PROJECTION ALIGNER WITH BENDING MIRROR

W. Thomas Novak, San Jose, and David W. Volmer, Santa Cruz, both of Calif., assignors to Computervision Corporation, Santa Clara, Calif.

Filed Mar. 2, 1981, Ser. No. 239,547

Int. Cl.³ G03B *27/68*

U.S. Cl. 355—52 **6 Claims**



1. In an optical projection device wherein the image of a mask or the like is projected through a narrow slit extending from one side of the mask to the other onto another surface the image moving at right angles to the slit to expose the entire mask, said device including at least one mirror reflecting the image of the mask onto said surface the improvement comprising means for anamorphically distorting said mirror whereby the size of the image lengthwise of said slit can be altered.

4,376,581

METHOD OF POSITIONING DISK-SHAPED WORKPIECES, PREFERABLY SEMICONDUCTOR WAFERS

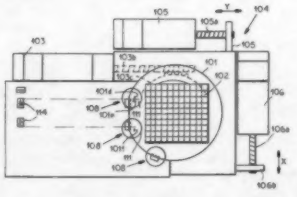
Herbert E. Mayer, Eschen, Liechtenstein, assignor to Censor Patent- und Versuchs-Anstalt, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 188,539, Sep. 18, 1980, abandoned. This application Dec. 29, 1980, Ser. No. 220,451

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951454

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—77 **5 Claims**



1. A method for preparing a semiconductor wafer for the formation of a pattern of circuit elements at predetermined locations on a surface thereof by selective illumination of a photosensitive layer on such surface through a mask in an exposure station after orthogonal and angular prealignment of the wafer in a prepositioning station,

comprising the steps of:

(a) providing the wafer with a peripheral edge having a distinctive portion and with optical surface markings inwardly from said edge;

(b) coarsely prealigning the wafer in the prepositioning

station by optical detection of said distinctive edge portion and of certain of said surface markings;

(c) transferring the wafer to the exposure station with the orientation imparted thereto in the prepositioning station; and

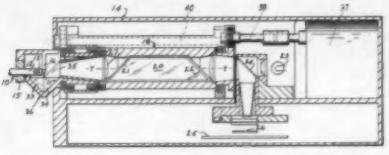
(d) more precisely adjusting the wafer in said exposure station by optically detecting other of said surface markings.

4,376,582

OPTICAL FUEL PIN SCANNER

Tommy L. Kirchner, and Hurshal G. Powers, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 9, 1980, Ser. No. 214,805
Int. Cl.³ G06K *9/24, 9/32;* G02B *27/17*
U.S. Cl. 356—71 **6 Claims**



1. An apparatus for optically scanning indicia imprinted about an outer cylindrical surface of an article, said apparatus comprising:

a supporting frame;

light detector means fixed to said frame for digitizing light patterns directed thereto;

indexing means on said frame for coaxially locating an imprinted outer cylindrical surface about a reference axis on the frame;

light means for illuminating said imprinted outer cylindrical surface located by said indexing means;

optical means rotatably mounted on said frame about said reference axis, said optical means including a dove prism centrally aligned along the reference axis and a radial light receiver overlying the position of an imprinted cylindrical area located by said indexing means for encircling the imprinted cylindrical surface and transmitting an image from said surface through the dove prism and to said light detector means;

and means for selectively rotating said optical means relative to the frame about the reference axis.

4,376,583

SURFACE INSPECTION SCANNING SYSTEM

W. Jerry Alford; Charles J. Cushing; James D. Hunt, all of Charlotte; Michael L. Smith, Matthews; Richard D. Vander Neut, Charlotte, and James L. Wilkes, Matthews, all of N.C., assignors to Aeronca Electronics, Inc., Pineville, N.C.

Filed May 12, 1981, Ser. No. 262,866
Int. Cl.³ G01N *21/00*
U.S. Cl. 356—237 **22 Claims**

1. A flaw inspection system comprising:

means defining an inspection surface;

means for repeatedly scanning a narrow beam of electromagnetic radiation along a line across said defined inspection surface;

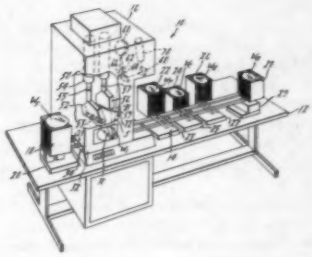
means for transporting a reflective surface element to be inspected at a predetermined speed along said inspection surface in a direction transverse to said scanning line;

means defining a normally light channel for receiving electromagnetic radiation specularly reflected from said transported element and producing a light channel output signal indicative of a change in said received specularly reflected radiation caused by flaws which may be present on said reflection surface;

means defining a normally dark channel for receiving scattered electromagnetic radiation reflected from flaws which may be present on said reflection surface of said transported element and producing a dark channel output signal indicative of said scattered radiation received therein;

first means connected to said light channel receiving means for comparing said light channel output signal with a first predetermined threshold level and outputting a predetermined signal level in a corresponding first threshold category channel whenever said light channel output signal and said first predetermined threshold level differ by a predetermined amount;

second means connected to said light channel receiving means for passing portions of said light channel output signal having frequency components within a predetermined range of frequencies and for comparing said passed portions with a bandpass threshold level and outputting a predetermined signal level in a corresponding second threshold category channel whenever said passed portions of said light channel output signal and said bandpass threshold level differ by predetermined amounts;



third means connected to said dark channel receiving means for comparing said dark channel output signal with a plurality of predetermined threshold levels and outputting a corresponding predetermined signal level in a corresponding threshold category channel whenever said dark channel output signal and a corresponding threshold level differ by predetermined amounts;

means for time sampling said threshold category channels a plurality of times during each scan and over a plurality of successive scans to define a plurality of sampling areas;

means for translating the occurrence of said output signal levels in said sampled threshold category channels into digital values according to the respective threshold category channels in which said output signal levels occurred;

means for storing each digital value according to its time location in the scan;

means for comparing said stored digital value with each successive digital value in a like time location within a corresponding sampling area and providing the greater of the compared digital values as the value designating the corresponding sampling area;

means for accumulating the occurrences of like designated sampling areas; and

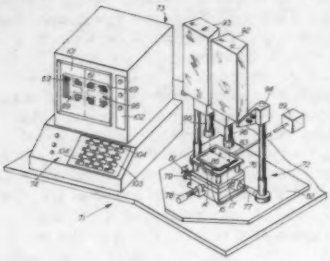
means for evaluating the quality of said transported element according to preset accumulation values.

4,376,584

PATTERN PRINTING INCLUDING ALIGNING MASKS AND MONITORING SUCH ALIGNMENT

Robert J. Hart, Lee's Summit, Mo., and Ralph C. Joseph, Allentown, Pa., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Jun. 2, 1980, Ser. No. 155,030
Int. Cl.³ G01B 11/00
U.S. Cl. 356—401 3 Claims



1. A method of adjusting a printing mask mounted in a visually inaccessible location of a printing apparatus relative to a first substrate holder having a first reference guide oriented in the direction of a reference axis of said first substrate holder, such that a pattern on the printing mask, including alignment marks, becomes located coincident with a predetermined position on a substrate when such substrate is placed against said first reference guide on said first substrate holder, the method comprising:

positioning a standard having at least one reference edge and having alignment features thereon located at predetermined distances from said at least one reference edge on a second substrate holder and with said at least one reference edge of said standard against a second guide located on said second substrate holder and oriented in the direction of a second reference axis, said alignment features including at least one set of fiducial marks which corresponds to the predetermined position of the alignment marks on the substrate;

manipulating the second substrate holder relative to two spaced fields of view of a viewing screen of an imaging system to directionally align the second reference axis with a centerline through said spaced fields of view;

generating cursor marks on said viewing screen, said cursor marks corresponding to the alignment marks of the pattern on said printing mask;

translating the second substrate holder with said standard thereon relative to the fields of view of said screen and said cursor marks on said screen to align the cursor marks and said at least one set of fiducial marks to each other;

placing a substrate against said first reference guide in said printing apparatus;

printing the pattern including the alignment marks of the printing mask onto the substrate;

positioning the substrate with the printed pattern in place of the standard on the second substrate holder;

comparing the position of an image of the printed alignment marks to the position of the cursor marks to determine a deviation of the printed alignment marks from the predetermined position on the substrate; and

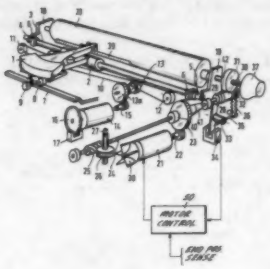
adjusting the position of the mask to correct any such deviation.

4,376,585

COMBINED PAPER ADVANCE AND INK RIBBON FEED SYSTEM

Lorenz Fromme, Ulm; Wolfgang Hendrischk, Neu-Ulm, and Werner Rupp, Nersingen-Leibi, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,116
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014822
Int. Cl.³ B41J 23/34, 33/32, 19/92
U.S. Cl. 400—185 11 Claims



1. In a printer having a print head, a paper advance mechanism, and an ink ribbon system, the print head being reversibly driven by a first motor, the combination for driving the paper advance mechanism and the ink ribbon system comprising:

a second reversible motor;

first means for coupling the paper advance mechanism to the second motor when rotating in a first direction;

second means for coupling the ink ribbon system to the second motor when rotating in a second direction, opposite the first direction; and whereby

the first and second means respectively are decoupled from the second motor when the second motor rotates in the second or the first direction.

6. In a matrix printer, a paper advance mechanism having a paper feed roller and comprising:

a reversible motor;

a shaft means;

a one-way coupling means for coupling the shaft means to the motor when rotating in one direction only;

a cam on the shaft means;

control means operated by the cam;

gear means for drivingly connecting the paper feed roller to the shaft means; and

second control means operated by the first control means for causing the motor to reverse after one revolution of the cam.

4,376,586

DRIVE MECHANISM FOR PRINTER CARRIAGE AND INK RIBBON

Tadao Fujisawa, Mishima, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1981, Ser. No. 227,536
Claims priority, application Japan, Jan. 31, 1980, 55-9333
Int. Cl.³ B41J 33/04
U.S. Cl. 400—229 13 Claims

1. A drive mechanism for printer carriage and printing ribbon comprising:

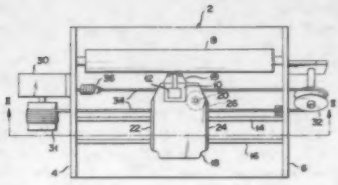
a rotatable ribbon feeding member adapted to feed a printing ribbon carried in a cassette;

a carriage moving member adapted to be rotatably mounted on a printer carriage;

a cord-like member provided in frictional contact with said carriage moving member;

drive means for driving said cord-like member for thereby

moving said carriage moving member along a printing line while causing rotation of said carriage moving member; and



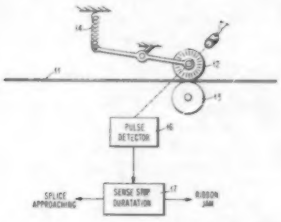
one-way clutch means for transmitting the rotation of said carriage moving member in a predetermined direction to said rotatable ribbon feeding member.

4,376,587

PRINT RIBBON PROTECTION

Donald K. Rex, Highland Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,584
Int. Cl.³ B41J *35/36*
U.S. Cl. 400—247 **4 Claims**



1. In an impact printer for printing markings on a record medium, said printer including a ribbon which is driven past a print station between said medium and a print head member, said member being controlled to impact against said ribbon to thereby leave a marking on said medium, said ribbon being an endless loop having a splice therein, the improvement comprising:

means for detecting a single characteristic of said ribbon indicative of ribbon motion,

said ribbon having an area adjacent to said splice which does not provide said characteristic indicative of said ribbon motion for a predetermined length of time,

means for determining the absence of said characteristic for said predetermined length of time or less to suspend printing while said splice passes said print station, and

means responsive to the absence of said detected characteristic for longer than said predetermined length of time, indicative of lack of ribbon motion, for suspending printing and for stopping ribbon drive.

4,376,588

BI-DIRECTIONAL SERIAL PRINTER WITH LOOK-AHEAD

Dennis L. Moeller, Del Ray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

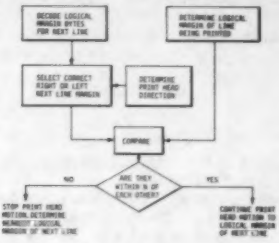
Filed Jun. 30, 1981, Ser. No. 278,946
Int. Cl.³ B41J *19/30*
U.S. Cl. 400—322 **5 Claims**

1. Print head control means to which a series of character codes are provided manifesting characters to be printed comprising:

buffer means for storing said character codes for a plurality of lines to be printed, the codes for separate lines stored in said buffer means being separated by a header code manifesting at least the left and right margin positions of the next line stored;

moving print head means for printing characters manifested by said character codes; and

processor means for controlling said print head movement, said processor means being operative during printing of a


DECODE LOGICAL MARGIN BYTES FOR NEXT LINE
DETERMINE LOGICAL MARGIN OF LINE BEING PRINTED
SELECT CORRECT RIGHT OR LEFT NEXT LINE MARGIN
DETERMINE PRINT HEAD DIRECTION
COMPARE
ARE THEY WITHIN N OF EACH OTHER?
NO
YES
STOP PRINT HEAD MOTION, DETERMINE NUMBER LOGICAL MARGIN OF NEXT LINE
CONTINUE PRINT HEAD MOTION TO LOGICAL MARGIN OF NEXT LINE

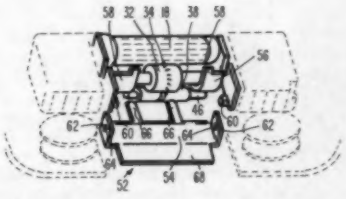
given line of characters for comparing the margin position of said next line in the direction of print head movement with the margin position of said given line, said processor means being operative to continue movement of said print head in the present direction of movement if said margin in the direction of print head movement of said next line is within a given number of character spaces of said margin of said given line.

4,376,589

MULTI-PLY UNGLUED PAPER DRIVE APPARATUS

Frank J. Avellanet, Plantation; Robert L. Battey, Fort Lauderdale, and Lloyd J. Burtrem, Bola Raton, all of Fla., assignors to Burroughs Corporation, Orlando, Fla.

Filed Jul. 20, 1981, Ser. No. 284,687
Int. Cl.³ B41J *15/20*
U.S. Cl. 400—606 **4 Claims**



1. In printing apparatus having printing means including fixed data thereon and impact imparting means for printing on paper stock interposed between said impact imparting means and said printing means and wherein paper stock is fed from a supply to said printing means by a web drive means the improvement comprising;

means mounting multi-ply unperforated unglued paper stock adjacent to said printing means for feed to said printing means;

means for simultaneously engaging each of the plies of said paper stock so as to feed said stock with each ply in register with the other plies of said stock to said printing means, said means for simultaneously engaging each of said plies comprises a demountable, rotatable, resilient member provided with a circularly disposed ring of paper stock pentrating elements and having a drive engaging member axially aligned therewith for demountable engagement with operably associated web drive means of the printing apparatus

means conjointly operable with said means for engaging

each of the plies and having a longitudinal axial extent greater than said ply engaging means providing intimate longitudinal contact with said paper stock and acting to maintain said stock in a substantially flat condition adjacent to said printing means; and

means for adjusting the entering angle of said paper stock relative to said printing means enabling said ply engaging means to entrap said plies prior to said printing means substantially horizontally eliminating any drag coefficient on the paper

said means for simultaneously engaging and said means for adjusting being snap-in demountable with respect to said printing apparatus.

4,376,590

WRITING IMPLEMENT

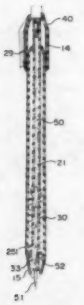
Chun-Liang Kuo, No. 328, 2nd Floor, Cheng Yi North Rd., San Chung City, Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 74,825, Sep. 12, 1979, which is a continuation-in-part of Ser. No. 919, 039, Jun. 26, 1978. This application Aug. 13, 1980, Ser. No. 177,793

The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

Int. Cl.³ B43K *21//16*

U.S. Cl. 401—57 **9 Claims**



1. A writing implement comprising:

an outer casing having an open converging lower end and an open upper end, the lower end being provided with a plurality of depressions near the top of the converging lower end and an opening below said depressions and near the distal end of said casing;

a coil spring disposed within the outer casing, the coil spring having a free upper end and a lower end comprising a coil portion and a writing material-pushing portion comprising a straight wire extending at an angle with the longitudinal axis of the coil spring said straight wire having a tip formed into a hook to correspond with said opening in the outer casing, the coil portion and writing material-pushing portion being formed integrally, the coil portion adapted to contact the depressions in the lower end of the outer casing;

an inner tube having an open upper end and a lower end and inserted into the outer casing and through the coil spring, the inner tube having an inside channel for for storing a plurality of presharpened pieces of a writing material, the lower end of the inner tube being formed into conical clamp portions, said conical clamp portions increasing in diameter towards the lower end of the inner tube and having two slots extending from the lower open end and along the longitudinal axis of the inner tube, one of said two slots being adapted to receive therein said writing material-pushing portion and provided with an end wall slanting upwardly toward the upper end of the inner tube, the inside diameter of the inner tube being reduced at the lowermost end by an amount sufficient to frictionally hold the writing material stored therein, pressing means disposed on the outside surface of the inner tube at a distance of from about ⅓ to ½ the length of the inner tube from the lower end of the inner tube, said pressing means adapted for pressing on the open end of the coil spring; and

a capping member adapted for blocking the open upper end of the inner tube.

4,376,591

CONTAINER CAP WITH NECK ABUTTING RETRACTABLE LIQUID PICKUP STRUCTURE

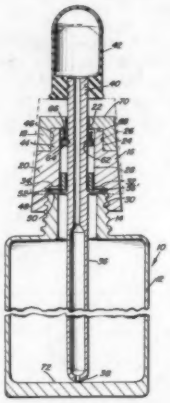
Charles L. Proffer, #11 53rd Street Cir., Gulfport, Miss. 39501

Continuation-in-part of Ser. No. 118,569, Feb. 4, 1980, Pat. No. 4,313,686. This application Nov. 4, 1980, Ser. No. 204,068

The portion of the term of this patent subsequent to Feb. 2, 1992, has been disclaimed.

Int. Cl.³ B65B *3/04*

U.S. Cl. 401—127 **5 Claims**

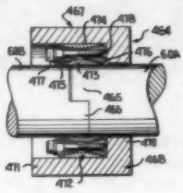


1. A cap and dispenser combination for reaching substantially completely to the bottom of the interior of an associated container, said combination including a cap body defining a first downwardly opening lower threaded recess therein for threadedly receiving a threaded container neck, an elongated upstanding dispenser shank including liquid pickup structure on its lower end, said dispenser shank being supported from said cap body for longitudinal shifting relative thereto between upper and lower limit positions and for rotation about its longitudinal center axis relative to said cap body with said dispenser shank generally centered in and projecting outwardly of said lower threaded recess, said dispenser shank and cap body including coacting means operable to releasably key said dispenser shank to said cap body against rotation of said dispenser shank relative to said cap body responsive to longitudinal shifting of said dispenser shank from its lower limit position toward its upper limit position, said dispenser shank including a radially outwardly projecting abutment disk carried thereby for abutting with the outer end of a threaded container neck, means operatively connected between said dispenser shank and cap body yieldingly biasing said shank toward its lower limit position relative to said cap body, said cap body defining an inwardly projecting generally radial annular shoulder at the inner end of said threaded recess, said coacting means including a sleeve loosely, slidably and rotatably received on said shank above said abutment disk and including a second radially outwardly projecting abutment disk loosely received in said threaded recess above the first mentioned disk, the upper and lower surfaces of said second abutment disk and said shoulder and the upper surface of the first mentioned abutment disk including coacting generally radial projection and recess portions engageable with each other axially of said dispenser shank.

4,376,592
SHAFT COUPLING

Harold H. Martinek, Danville, Ill., assignor to Teepak, Inc., Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,772
Int. Cl.³ F16D 1/12
U.S. Cl. 403—26 7 Claims

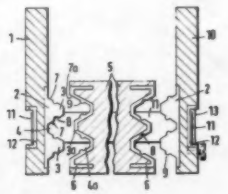


1. A drive shaft coupling comprising first and second shafts of a preselected diameter, each of said shafts having a projecting end portion of semicircular section and including a diametrical flat, said projecting end portions being of a different length and overlapped with said flats in opposed contacting relation, a sleeve with a stepped internal diameter encircling said overlapped end portions in radially spaced relation, and an annular wedge element disposed within said sleeve and surrounding said end portions, said wedge element being wedged between said sleeve and said overlapped shaft end portions and tightly clamping said flats together to interlock said shafts in fixed relative rotational relation.

4,376,593
BODY ASSEMBLY

Rudolf Schaefer, Brauerstrasse 35, D-4100 Duisburg 1, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,561
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926976
Int. Cl.³ B25G 3/00
U.S. Cl. 403—231 23 Claims



1. In a body formed of at least first and second connected individual elements which are connected together at abutting respective connecting surfaces by means of tongue and groove connections with one of said elements having at least one tongue on its said connecting surface and the other of said elements having at least one groove on its said connecting surface for receiving said at least one tongue, each said tongue having flanks which are inclined with respect to the base of the tongue and converge with increasing distance from said base, and each said groove having a shape such that the flanks of the groove will abut the adjacent flanks of the associated tongue; the improvement wherein for each associated said tongue and said groove, at least one flank of one of said associated tongue and groove is provided with a projection and the associated said flank of the other of said associated tongue and groove is provided with a recess which engages said projection when said tongue is inserted into the associated said groove; and wherein said projection and the associated said recess have shapes such that said projection is releasably engaged in said recess by a snapping action.

4,376,594
TRAFFIC GUIDE EMPLOYABLE AS A MEDIAN BARRIER AND ROAD EDGE BARRIER

Pius Prosenz, Neunkirchner Str. 42a, A-2700 Wiener Neustadt, Austria

PCT No. PCT/AT79/00009, § 371 Date Aug. 15, 1980, § 102(e) Date Aug. 14, 1980, PCT Pub. No. W080/01292, PCT Pub. Date Jun. 26, 1980
PCT Filed Dec. 14, 1979, Ser. No. 199,930
Claims priority, application Austria, Dec. 15, 1978, 8949/78
Int. Cl.³ E01F 13/00
U.S. Cl. 404—6 6 Claims

1. A road barrier comprising:

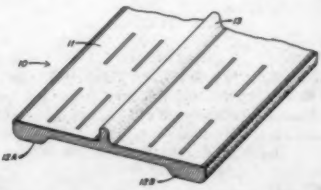
a rigid elongated concrete body extending along a travel lane and rising above the grade thereof to a height of about 30 cm to lie below lateral chassis portions of a vehicle traveling on said lane, said body having a vertical lower face turned toward said lane and extending upwardly from grade to an edge about 6 cm above grade, a continuously curved flank of progressively increasing steepness rising from said edge concave toward said lane and progressively receding upwardly from said lane, and a bead projecting laterally towards said lane at the top of said flank and overhanging said flank; and

a strip of a material having lower friction than concrete and harder than concrete on said bead, verticals from outermost surfaces of said strip intercepting said flank substantially along the midpoint of the height thereof between said edge and said bead.

4,376,595
MONOLITHIC WATER-PERMEABLE CONCRETE ROADWAY AND RELATED LARGE AREA STRUCTURES WITH INTEGRAL DRAINAGE ELEMENTS

Arthur Shaw, 101 Stock Isle Apts., Key West, Fla. 33040

Filed Aug. 8, 1980, Ser. No. 176,514
Int. Cl.³ E01C 1/00
U.S. Cl. 404—17 12 Claims



1. In a concrete roadway of the type comprising an elongated structure of concrete having a thickness, width and generally flat upper surface for accommodating and supporting vehicular traffic, the improvement wherein said roadway comprises a monolithic structure of water-permeable concrete comprising:

plural elements of coarse aggregate each having a size in the range of ¼ to ½ of an inch, each cubic yard of aggregate elements having been sized in an aqueous suspension of 15 to 22 pounds of silicon dioxide of no greater than 100 mesh in 16 to 22 gallons of water; and

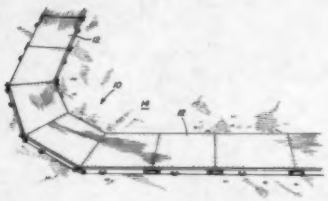
between 384 and 480 pounds of cement for each cubic yard of sized aggregate elements, the elements of coarse aggregate being cemented together at points of contact by a layer of cement to provide a plurality of voids between adjacent ones of said elements of aggregate.

4,376,596

PORTABLE ROADWAY

M. L. Green, W. Columbia St., Magnolia, Ark. 71753

Filed Apr. 16, 1980, Ser. No. 142,177
Int. Cl.³ E01C 5/16
U.S. Cl. 404—35 **2 Claims**



1. A portable roadway for facilitating vehicular traffic comprising a plurality of sections, each section including:

a framework having longitudinal, parallel side members and a pair of transverse forward and rear members connected to said side members;

a top panel connected to and overlying said framework in flush peripheral relation;

a forward stiffening bar extending transversely between said side members and disposed adjacent and parallel to said forward frame member;

a rear stiffening bar extending transversely between said side members and disposed parallel and adjacent to said rear frame member, said forward and rear stiffening bars having free ends extending laterally of said framework;

a metal strap pivotally connecting the free ends of the forward and rear stiffening bars of adjacent sections, said laterally extending free ends of the stiffening bars being threaded and having nuts attached thereto disposed against said frame members to apply inward forces to the side frame members, each metal strap including an aperture adjacent one end for pivotal mounting on the free end of one stiffening bar and a downwardly opening notch adjacent the other end for detachable engagement with the free end of a stiffening bar on an adjacent section; and

a lifting bar located intermediate said forward and rear stiffening bars and extending transversely between said side members.

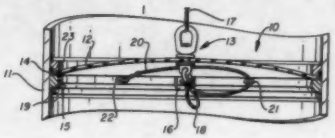
4,376,597

PULL-OUT DIAPHRAGM SEAL FOR HOLLOW TUBES

Frederick G. Britton, Bedford; William G. Stanfield, Dallas, and Don B. Landers, Arlington, all of Tex., assignors to Oil States Industries, Inc., Arlington, Tex.

Filed Mar. 4, 1981, Ser. No. 240,563
Int. Cl.³ E02B 3/16
U.S. Cl. 405—195 **19 Claims**

1. In combination with a water immersible hollow tubular member such as an underwater piling guide and the like, a pull-out seal assembly for closing the immersible end of the hollow tubular member, including: a closure having an enlarged annular reinforcing ring; capture means for said annular reinforcing ring including, upper ring means fastened to the inner wall of said hollow tubular member, and a split ring having removable key means positioned between split ring ends and removable from between said split ring ends with the split ring at its maximum diameter size with said key means in place between split ring ends held in place captive along with



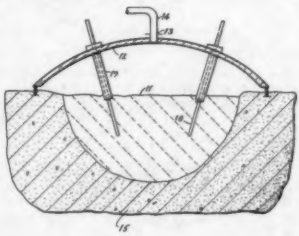
said enlarged annular reinforcing ring between said upper ring means and said lower ring means; tension pull means connected to said removable key means, said split ring, and said closure for removing said key means, said split ring and said closure from the closure state in the hollow tubular member.

4,376,598

IN-SITU VITRIFICATION OF SOIL

Richard A. Brouns, Kennewick; James L. Buelt, and William F. Bonner, both of Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 6, 1981, Ser. No. 251,663
Int. Cl.³ E02D 3/00
U.S. Cl. 405—258 **15 Claims**



1. A method for in-situ vitrification of soil, comprising the following steps:

inserting at least one pair of electrodes into the soil at spaced positions from one another;

providing an initial electrically conductive resistance path in the soil across the electrodes;

passing electrical current through the electrically conductive resistance path by application of current to the electrodes to heat the soil about the path to its melting temperature, thereby establishing a current-carrying pathway through the molten soil between the electrodes;

continuing application of current to the electrodes until the soil between them and immediately adjacent to them has been melted; and

terminating application of current to the electrodes to permit cooling and solidification of the melted soil into a solid mass.

4,376,599

DITCH SHORING UNIT

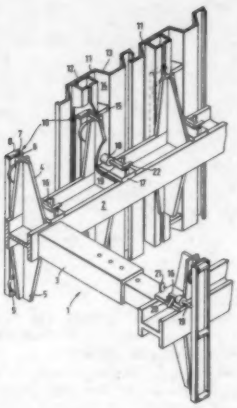
Josef Krings, Hans-Böckler-Strasse 23, 5138 Heinsberg-Oberbruch, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,433

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004923

Int. Cl.³ E21D 5/12

U.S. Cl. 405—282 6 Claims



1. A ditch shoring unit comprising:

a horizontal support frame including at least one longitudinal girder having a plurality of spaced-apart, transversely-disposed guide heads mounted thereon, said guide heads having at least one rotatable roller mounted thereon;

a plurality of overlapping, vertically-disposed pile-driving deal boards, each of which has a wave-shaped cross section and a vertically-extending generally C-shaped guide channel provided on an inside surface thereof in which an associated guide head of said girder is received for positive locking and sliding reception therein, said deal boards also having a second vertically-extending channel on said inside surface thereof adjacent to said C-shaped guide channel and a plurality of vertically-superimposed, spaced-apart abutments which serve as horizontal partitions formed on the inside surface thereof; and

a plurality of locking means mounted on said longitudinal girder for each of said deal boards, each of said locking means including a retractable locking element moveable into and out of the area between two superimposed abutments of an associated deal board for restricting and allowing free movement thereof, respectively.

4,376,600

ROTATING MATERIAL FEED FOR APPARATUS FOR PNEUMATIC CONVEYING OF LOOSE MATERIALS

Ernst Egli, Fahrweid, Switzerland, assignor to Aliva Aktiengesellschaft, Widen-Mutschellen, Switzerland

Filed May 7, 1981, Ser. No. 261,549

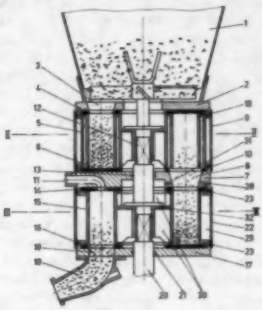
Claims priority, application Switzerland, May 27, 1980, 4113/80

Int. Cl.³ B65G 53/46

U.S. Cl. 406—63 3 Claims

1. An infeed device for transferring loose dry material from a hopper to an outlet from which the material is carried by pressure air, said infeed device comprising rotor means rotatable on a vertical axis and having circumferentially arranged material chambers that are open at their tops and bottoms, and said infeed device further comprising fixed structure on which said hopper is supported and which comprises vertically spaced horizontal plates between which said rotor means rotates and with which it has sealing engagement at its top and bottom, an upper one of said plates having therein a material inlet through which material falls from said hopper into material chambers that are brought beneath said inlet by rotor rotation, and said fixed structure having a pressure air inlet from which pressure air is blown downwardly through material chambers that are upwardly aligned with said outlet, for discharge of material into and beyond said outlet, said infeed device being characterized by:

A. said rotor means comprising at least two rotors, one above the other, that are coaxial and are constrained to rotate in unison, said rotors having like numbers of material chambers so arranged that each material chamber in the upper rotor is coaxial with a material chamber in the rotor below it;



B. said fixed structure comprising a plate between said upper rotor and the one therebeneath, in sealing engagement with those rotors, having a passage therein through which material can fall from chambers of the upper rotor into chambers of the rotor therebeneath, said passage being circumferentially spaced from said material inlet; and

C. said upper rotor having pressure chambers therein which are closed at their tops and which have open bottoms that register with said passage as the upper rotor rotates, to receive pressure air from material chambers of said rotor therebeneath.

4,376,601

MATERIAL CONVEYOR

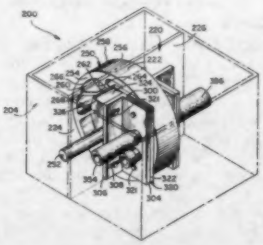
Douglas E. Laseter, 5115 Old Canton Rd., Apt. K-7, Jackson, Miss. 39211

Filed Aug. 18, 1980, Ser. No. 179,162

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ B65G 53/46

U.S. Cl. 406—64 4 Claims



1. A device for conveying granular material comprising:

a housing having a partition dividing said housing into two

compartments, a first one of said compartments having a material entrance defined therein;

an induction wheel rotatably mounted on said housing, said wheel being essentially upright and having a plurality of elongate open-ended chambers defined therein, said wheel passing through said partition to be located partially in each of said compartments;

a pair of L-shaped mounting brackets, each bracket having one leg thereof being movably mounted on said partition and having a second leg oriented adjacent to and essentially parallel with one face of said induction wheel, said brackets being located in the other of said pair of compartments;

a pair of wipers, each wiper being mounted on one of said mounting bracket second legs to be pressed against one of said induction wheel faces, each wiper being L-shaped and having one leg thereof mounted on said mounting bracket second leg and having the other leg thereof extending through said partition into said first compartment, each of said wiper other legs having a beveled edge located to be adjacent to one of said wheel faces and located so that said wheel passes said wiper beveled edges to gently remove excess material from the ends of said chambers without damaging that removed material, said wiper beveled edges being shaped to define a material escape path over which said gently removed material passes;

said wiper one legs each forming a sealing means sealingly covering said chamber ends in a secure manner, said sealing means being integral with said wiper to be located so that a chamber on said induction wheel passes said wiper prior to passing said sealing means, said wiper removing excess material from adjacent the ends of a chamber before such chamber is sealed by said sealing means so that material does not interfere with any seal formed between said sealing means and said chamber ends such that said chambers are securely closed to minimize loss of any gas introduced into said chambers for moving material out of said chambers;

adjustment means movably attaching each of said mounting brackets to said partition, each of said mounting brackets being movable toward and away from said wheel via said adjustment means so that each of said wipers are movable independently of the other wiper;

gas introducing means connected to said sealing means to introduce gas from a source into a chamber; and

material transport means connected to said sealing means to receive gas and material from said chambers for transporting said material away from said induction wheel.

4,376,602

METHOD AND EQUIPMENT FOR REMOVING PACKING COKE FROM BAKING CHAMBERS FOR CARBON BODIES

Jonas R. Landmark, Hosle, and Paul A. Schneider, Oslo, both of Norway, assignors to Ardal og Sunndal Verk a.s., Oslo, Norway

Filed Sep. 29, 1980, Ser. No. 192,022
Int. Cl.³ B65G *53/24*
U.S. Cl. 406—115 **1 Claim**

1. In a system for removing packing coke from baking chambers of a furnace for baking carbon bodies, said system including a crane mounted for movement along a rail, a silo supported by said crane, a suction tube connected to said silo and insertable into packing coke in a furnace baking chamber, and means for supplying vacuum to said suction tube to remove said packing coke therethrough from said chamber into said silo, the improvement wherein said vacuum supplying means comprises:

a closed vacuum duct extending parallel to said rail, said vacuum duct having an upper slide surface, and a plurality of valves spaced along said slide surface;

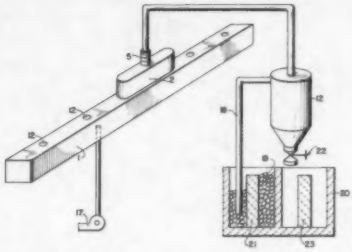
a stationary vacuum source connected to said vacuum duct and creating therein a vacuum;

a sliding box supported by said crane and movable thereby along said vacuum duct over said valves on said slide surface;

means for connecting the interior of said sliding box to said silo;

each said valve being openable by a respective pneumatic cylinder;

an activating rail mounted on said sliding box and operable upon movement of said sliding box along said vacuum duct to activate said pneumatic cylinders to open respective said valves, whereby vacuum from said stationary vacuum



source is communicated through said vacuum duct, the opened said valves, said sliding box, said connecting means and said silo to said suction tube;

said sliding box having supporting wheels rolling on said vacuum duct and guide wheels positioning said sliding box on said vacuum duct; and

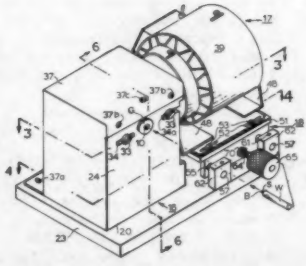
said sliding box having a sliding gasket sealingly contacting said slide surface of said vacuum duct, said sliding gasket comprising a rubber skirt into which is fitted an elastic gasket of a material with a low coefficient of friction and sliding along said slide surface.

4,376,603

DEBURRING MACHINES FOR SHOP AND SCREW MACHINE PARTS

Herbert E. Hudgins, Gastonia, N.C., assignor to A. B. Carter, Inc., Gastonia, N.C.

Filed Sep. 22, 1980, Ser. No. 189,631
Int. Cl.³ B23C *3/12*; B23D *47/04*; B24B *7/16*
U.S. Cl. 409—140 **5 Claims**



1. Apparatus for removing an axially projecting burr (B) from and flush with a surrounding eccentrically disposed flat end surface (S) of an elongated hand-held shop or screw machine part (W) comprising

(a) guide means including a bore (10) into which the burred end portion of said part (W) is axially and reciprocally insertable;

(b) disintegrating means (36) aligned with said burred end portion along a path coinciding with the axis of said bore, said disintegrating means being responsive to the axial

insertion of said end portion for progressively removing said burr (B) and

(c) at least one positive stop (32) aligned with and engagable by said eccentric end surface (S) along a second path parallel to said first path of insertion and

(d) means operable upon engagement of said stop by said end surface (S) for arresting the insertion of said burred end portion and the disintegration of said burr simultaneously with the removal of the latter flush the end surface;

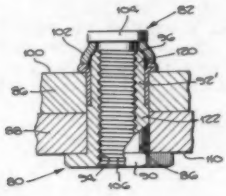
(e) said disintegrating means consisting of a saw (36), said stop (32) and the cutting edge of said saw at the axis of said bore lying in a common plane (29a) parallel to said end surface (S) and normal to the axis of the bore.

4,376,604

BLIND FASTENER FOR COMPOSITE MATERIALS

John D. Pratt, Rancho Cucamonga, and Cu S. Huynh, Buena Park, both of Calif., assignors to Monogram Industries, Inc., Santa Monica, Calif.

Filed Jan. 29, 1981, Ser. No. 229,323
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—34 **10 Claims**



1. In a blind fastener having a nut with an internally threaded axial bore throughout with a generally conically shaped nose portion at one end and a head of larger diameter than said nose portion at the other end, and an intermediate generally cylindrical portion of lesser diameter than said head between the nose portion and the head, a corebolt having a head and a threaded shank portion, the threaded shank portion being threaded in the axial bore of the nut, the improvement which comprises:

(a) a first expansible cylindrical sleeve having an internal diameter which is sized to create a sliding fit on the intermediate portion of the nut, said first sleeve being disposed on said intermediate portion in abuttment with a portion of the nut adjacent the head thereof; and,

(b) a second expansible cylindrical sleeve having an internal diameter which is sized to create a sliding fit on the shank portion of the corebolt, said second sleeve being disposed on said shank portion between the head of the core bolt and said first sleeve, said second sleeve being adapted to perform in the manner of a less ductile material than said first sleeve, said first and second sleeves meeting in non-sliding abutting surfaces whereby as the nut and corebolt are threaded together compressive forces are transmitted through said second sleeve into said first sleeve to deform said first sleeve radially outward and back along the intermediate portion of the nut towards the head of the nut and said second sleeve is expanded primarily by the nose portion of the nut.

4,376,605

CAPTIVE STANDOFF BUSHING

Jack W. Thomsen, LaGrange Park, Ill., assignor to Weckesser Co. Inc., Chicago, Ill.

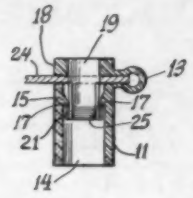
Filed Jul. 14, 1981, Ser. No. 283,178
Int. Cl.³ F16B *5/00, 37/04*; H01B *17/24*; H05K *7/12*
U.S. Cl. 411—112 **4 Claims**

1. A captive standoff bushing for cooperating with an apertured panel member for rigidly mounting the member in a spaced or stacked isolated relation to other like apertured panel members comprising,

(a) a tubular anchor member, having a center bore the diameter of which is greater than the aperture formed in the panel member,

(b) a locking member including a circular base collar,

(c) said locking member including a pair of spaced apart legs extending laterally of one side of said circular base collar,



(d) a locking ring connecting the extremities of said spaced apart legs together, and having a diameter less than that of said bore of said tubular anchor member so as to be capable of being freely journalled therein, and

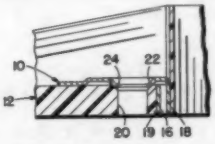
(e) restraining means within said tubular anchor member and extending transversely to the long axis thereof adapted to project between said spaced apart legs and behind said locking ring of said locking member when said locking ring is journalled in said anchor member for locking said locking member within said tubular anchor member.

4,376,606

LOAD-DISTRIBUTING WASHER FOR PLASTIC MEMBERS

Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 19, 1980, Ser. No. 188,638
Int. Cl.³ F16B *43/00*
U.S. Cl. 411—155 **6 Claims**



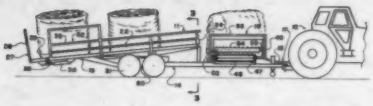
1. A device for clamping a resilient plastic member which has a plurality of bolt-receiving apertures to a metal substrate, said device comprising a resiliently deformable, generally polygonally shaped washer, a hole extending through the washer which has a diameter that is at least equal to that of the bolt, an extending collar portion surrounding at least a portion of the hole and projecting generally axially of the washer, said collar portion being received in at least part of one of the bolt-receiving apertures of the plastic member, a metal-substrate-engaging member located adjacent said hole, said metal-substrate-engaging member providing metal-to-metal clamp loading through the plastic member and being non-centrally located so as to act as a pivot for the washer whereby a large portion of the washer body is brought into engagement with the plastic member to distribute the clamping load over a broad surface to thereby substantially reduce joint loosening caused by plastic creep.

4,376,607

BALE HANDLING APPARATUS

David W. Gibson, Box 117, Springdale, Mont. 59082

Filed Jul. 27, 1981, Ser. No. 287,285
Int. Cl.³ A01D 87/12
U.S. Cl. 414—24.6 10 Claims



1. Bale handling apparatus including a base portion, a bale moving portion, a bale distributing portion and a control portion; said base portion including a frame section, wheeled carriage means supporting said frame section, a hitch member disposed at one end of said frame section, a ramp section having a lower receiving end and an upper discharge end, said lower end of said ramp section being adjacent the end of said frame section remote from said hitch member, said ramp section extending upwardly from said end of said frame section toward said hitch member a distance more than one-half the length of said base portion, closure means located adjacent the lower end of said ramp section, retaining means associated with the longitudinal edges of said ramp section; said bale moving portion including conveying means disposed longitudinally of said ramp section and between the longitudinal edges thereof; said bale distributing portion being disposed on said base portion adjacent the raised end of said ramp section, said bale distributing portion including a frame section, bale rotating means extending between members of said frame section, said bale rotating means being oriented transversely of said conveying means, said bale distributing portion including a generally horizontal bale supporting surface, said bale supporting surface being disposed below the upper end of said ramp section, retaining means associated with portions of the periphery of said frame section remote from said ramp section; said control portion including means for driving said conveying means and said bale rotating means; whereby bales positioned on said ramp section of said apparatus are advanced up said ramp section and discharged onto said support surface of said bale distributing portion where each is rotated by said bale rotating means to distribute material therefrom as said apparatus is moved over a field.

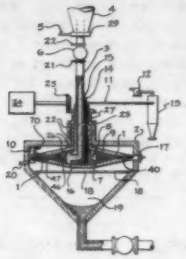
4,376,608

KINETIC EXTRUDER - A DRY PULVERIZED SOLID MATERIAL PUMP

John W. Meyer, Palo Alto; John H. Bonin, Sunnyvale, and Arnold D. Daniel, Jr., Pleasanton, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 32,646, Apr. 23, 1979, abandoned. This application Sep. 17, 1980, Ser. No. 188,047
Int. Cl.³ F23D 11/06
U.S. Cl. 414—217 14 Claims

12. Apparatus for feeding a pulverized material from a supply source to a housing maintained at elevated pressure, said apparatus including a rotor disposed in said housing and a feed means, said rotor operably connected to the feed means for receiving the pulverized material and discharging it within the housing, said rotor including a first means for forming a plug of the material, said first means having a material inlet and outlet, and said rotor including a second means for controlling the flow of material through said rotor, said second means spaced from the outlet of the first means and substantially in alignment therewith, said second means including an isobaric control nozzle having a fixed geometry, said control nozzle sized to control the flow of said material through said rotor and through said apparatus, said control nozzle further defined as including at least one fixed port communicating with the interior of said housing for maintaining the junction between said



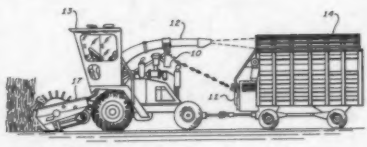
first and second means at the same pressure as the pressure in said housing.

4,376,609

AUTOMATIC SPOUT CONTROL FOR AGRICULTURAL MACHINES

Carl E. Bohman, New Holland, Pa.; Hugh C. Maguire, Westford, and Bradley J. Thompson, Maynard, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,949
Int. Cl.³ B65G 67/22
U.S. Cl. 414—335 10 Claims



1. Apparatus for automatically controlling the direction of a crop discharge spout of an agricultural machine with respect to a collector vehicle associated therewith, comprising:

first means affixed to said discharge spout, for transmitting and receiving an optical signal;

a rotating reflective surface cooperating with said first means to scan a selected area with said optical signal;

passive target means affixed to said associated collector vehicle for reflecting said optical signal whereby said first means provides output signals in response to optical signals reflected from said passive target means;

second means coupled to said first means for generating control signals when said first means receives a reflected optical signal from said passive target means; and

utilization means coupled to said discharge spout and responsive to said control signals for aligning said discharge spout with said collector vehicle, such that crop discharge is continuously directed into said associated collector vehicle.

4,376,610

STORAGE AND HANDLING SYSTEM FOR PHOTOGRAPHIC SLIDES AND THE LIKE AND METHOD

John W. Sofia, 138 Lancaster Ter., Brookline, Mass. 02146

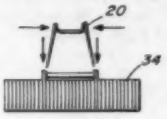
Filed Jul. 7, 1980, Ser. No. 166,062
Int. Cl.³ B65G 61/00
U.S. Cl. 414—416 8 Claims

1. A method of storage, removal and handling of photo-transparency slides stacked in a slide storage tray by utilizing a movable spacer and tongs comprising the steps of:

(a) inserting a self-supporting movable spacer having a pair of end walls held in fixed spaced apart relation to each

other into a sector of a slide storage tray thereby to partition a predetermined number of slides between the end walls of said spacer said end walls being spaced apart a distance corresponding to the thickness of said predetermined number of slides;

(b) creating a compressive force on the tongs by manually squeezing across one pair of tongue arm ends to spread



the arms of said tongs against the partitioning end walls of said spacer;

(c) inserting the spread arms of said tongs a sufficient depth within said spacer so that upon cessation of said compressional force, the predetermined number of slides will be held end-to-end between the opposing arms of said tongs.

4,376,611

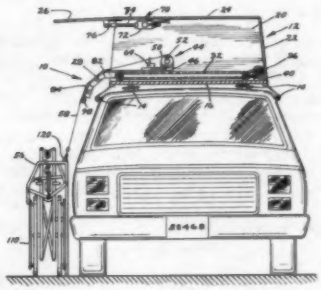
CAR TOP CARRIER FOR WHEELCHAIR

Bruce H. Koop, 3326 Edgewood North, Crystal, Minn. 55427

Filed Jun. 4, 1981, Ser. No. 270,347

Int. Cl.³ B60R 9/04

U.S. Cl. 414—462 **11 Claims**



1. A car top wheelchair carrier for storing a wheelchair on top of a car and for raising and lowering the chair to and from the car top, said carrier including:

a carrier case mounted on a car top and open to one side of the car, said carrier case including a floor, a side wall extending upwardly from the floor at a side opposite the open side, and a roof;

a moving platform movably mounted with respect to the carrier case floor to be movable between a loaded position entirely within the case and an unloading position extending partially outside of the open side of the case;

means for moving the platform between said loaded and unloading positions;

a wheelchair cage adapted to temporarily encompass and retain a wheelchair;

winch means mounted inside of the case;

cable means extending between said winch means and said wheelchair cage;

said winch means being operable when said platform is in its unloading position to permit the cable means to unwind from the winch means to allow said wheelchair cage to move from retracted position on said platform to unloaded position adjacent the ground and to wind the cable means onto the winch means to move the cage from unloaded position to retracted position; and

the moving platform having a downwardly hinged outer edge portion adjacent the open side of said case, said hinged portion being so contructed and restricted as to fold downwardly to no more than an acute angle to the horizontal as said platform moves toward its unloading position and to fold up flat as it moves toward its loaded position.

10. A wheelchair cage adapted selectively to either encompass and retain a folded wheelchair or to release a formerly retained wheelchair, said wheelchair cage including:

a rigid rectangular upright back frame member;

a front hood member extending away from and pivotably connected to an upper portion of said back frame member;

a locking linkage assembly operative between said front hood member and said back frame member to move said members relative to each other to move the wheelchair cage between an encompassing and retaining condition and a releasing condition; and

engaging arms extending from said back frame member toward said front hood member and from said front hood member toward said back frame member in position to engage a folded wheelchair when the cage is in its encompassing and retaining condition and to be movable to position to be clear of said wheelchair when the wheelchair cage is in its releasing condition.

4,376,612

EARTHWORKING MACHINE OF THE LOADER TYPE

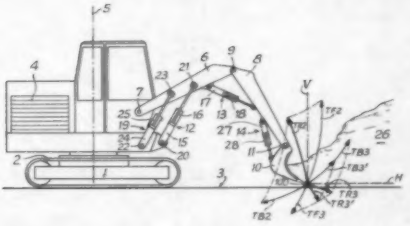
Victor Yeou, Meaux, France, assignor to Poclain, Le Plessis-Belleville, France

Filed May 12, 1981, Ser. No. 263,097

Claims priority, application France, May 28, 1980, 80 11825; Apr. 7, 1981, 81 06981

Int. Cl.³ E02F 3/42, 9/22

U.S. Cl. 414—694 **13 Claims**



1. In an earthworking machine of the loader type, constituted by:

a frame,

a boom mounted to pivot with respect to the frame about a first axis,

a balance beam mounted to pivot with respect to the boom about a second axis, the first and second axes being parallel to each other,

a material loading bucket coupled to the balance beam, preferably by means of a third pivot axis and a bucket jack,

a double-acting, boom jack, coupled between the frame and the boom and comprising a boom raising chamber and a boom lowering chamber,

double-acting, balance beam jack, coupled between the boom and the balance beam and comprising a chamber for extension of the balance beam with respect to the boom and a chamber for return of the balance beam with respect to this boom,

a circuit for supplying said jacks with pressurised fluid comprising:

at least one source of pressurised fluid, and

at least two three-way control valves disposed as follows:

a boom control valve between the boom jack and a source of fluid under pressure and a balance beam control valve between the balance beam jack and a source

of fluid under pressure, each capable of selectively placing one of the chambers of the corresponding jack in communication with the source of fluid under pressure, with an exhaust or of isolating this chamber from said source of fluid under pressure and, correlatively, of placing the other chamber in communication with the exhaust, with the source of pressurised fluid, or of isolating this other chamber from said source of pressurised fluid, and

a secondary jack coupled between the frame and the boom and comprising at least one active chamber, a first conduit connects this active chamber of the secondary jack to the chamber for extension of the balance beam jack, a first cut-off valve with at least two positions being disposed in this first conduit, establishing, in its first position, the communication of the two sections of the first conduit connected thereto, but, in its second position, isolating these two sections.

4,376,613

SIDE CHANNEL COMPRESSOR

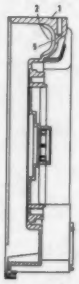
Klaus Schoenwald, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,760

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714459

Int. Cl.³ F04D *5/00*

U.S. Cl. 415—53 T **4 Claims**



1. In a side channel compressor of the type having a side channel within an inlet and outlet opening and at least one rib projecting into the side channel in the axial direction of the compressor, the improvement comprising:

said rib having a substantially triangular cross section and being arranged in a direction substantially transverse to said side channel approximately mid-way between said inlet and outlet openings and having a height which is approximately 10 to 25% of the depth of said side channel, whereby cavity resonances in the side channel are substantially attenuated.

4,376,614

PROPELLER BRAKE FOR A TURBO-PROP ENGINE

Frank Woodruff, New Hartford, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 29, 1980, Ser. No. 191,730

Int. Cl.³ F01D *21/14*

U.S. Cl. 416—32 **26 Claims**

1. A propeller brake for a twin spool turbo-prop engine wherein the engine's propeller is independently driven by one of said twin spools, comprising:

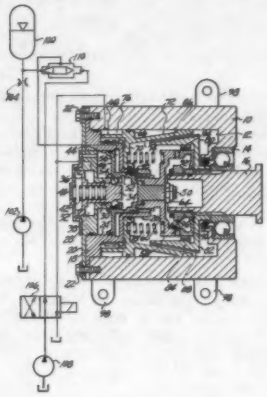
a housing having an internal chamber and means for attaching said housing to the engine;

a shaft having one end adapted to be rotatably connected to the one spool driving the engine's propeller and the other end and supported for rotation relative to said housing disposed in said chamber;

means for generating a propeller signal in response to the rotation of the one spool;

means for generating an engine signal in response to the rotation of the other spool;

signal generator means for generating a first input signal in response to said engine signal and an external command to stop the rotation of the propeller and for generating a second input signal in response to either the simultaneous



absence of said engine and propeller signals or to the absence of said propeller signal and an external command to stop the rotation of the propeller;

brake means disposed in said chamber for frictionally interconnecting said shaft and said housing in response to said first input signal to generate a force retarding the rotation of said shaft relative to said housing; and

lock means disposed in said chamber for non-rotatably interconnecting said shaft and said housing in response to said second input signal to inhibit the rotation of said shaft relative to said housing.

4,376,615

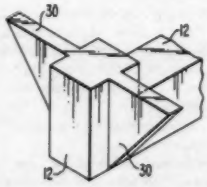
ELECTROMAGNETIC PUMP

George T. Hummert, Oakmont, and Ian R. McNab, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1979, Ser. No. 97,274

Int. Cl.³ H02N *4/20*

U.S. Cl. 417—50 **5 Claims**



1. An electromagnetic pump comprising:

a duct;

an electrically conductive fluid in said duct;

electrode means disposed around said duct for establishing a flow of electric current through said duct; and

magnetic core means disposed around said duct at approxi-

mately a 90° angle to said electrode means and extending beyond said electrode means and along the longitudinal axis of said duct with a maximum length of approximately 5 percent to 25 percent of the length of said electrode means for establishing a magnetic field through said duct and for reducing current, magnetic, and turbulent losses in said duct thereby increasing pump efficiency.

4,376,616

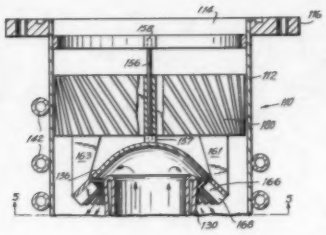
DIFFUSION PUMP

Tadeusz J. Marchaj, Long Island, N.Y., assignor to Preload Technology, Inc., Garden City, N.Y.

Continuation of Ser. No. 662,501, Oct. 15, 1975, abandoned. This application Mar. 27, 1978, Ser. No. 890,222

Int. Cl.³ F04F 9/00

U.S. Cl. 417—153 **4 Claims**



1. A vacuum pump adapted to prevent backstreaming of motive vapor molecules into the space to be evacuated, comprising:

(a) a cylindrical pump body having an inlet port in an upper part thereof and an outlet port in a lower part thereof;

(b) boiler means housed within the bottom part of said pump body for vaporizing a motive fluid;

(c) at least one, substantially cylindrical, vapor chimney positioned within said pump body, communicating at its lower end with said boiler and discharging vaporized motive fluid from the boiler into said pump body, said pump body and chimney defining an annular zone therebetween;

(d) cooling means surrounding the exterior of said cylindrical pump body for condensing motive fluid vapors within said annular zone;

(e) a fan rotor rotatably positioned adjacent said inlet port, said rotor including vanes positioned to impel motive fluid and evacuated vapors downwardly into said cylindrical pump body;

(f) a cap for said chimney fixedly positioned above said chimney, said cap and chimney top defining an annular effluent port, said cap deflecting motive fluid vapors downwardly within the annular zone defined by said chimney and pump body; and

(g) radial turbine means rotatably positioned adjacent said annular effluent port and connected to said fan.

4,376,617

TURBOCHARGER FOR USE IN AN INTERNAL COMBUSTION ENGINE

Hiroshi Okano, Mishima, and Masami Yamazaki, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 19, 1981, Ser. No. 226,095

Claims priority, application Japan, Apr. 17, 1980, 55-049536

Int. Cl.³ F04B 17/00

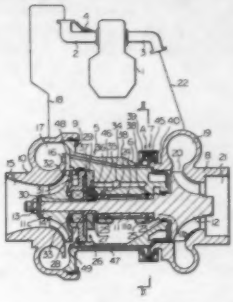
U.S. Cl. 417—407 **11 Claims**

1. A turbocharger having a rotary shaft, comprising:

a center housing rotatably supporting the rotary shaft therein and having axially spaced first and second end portions, said first end portion having a radially outwardly extending annular flange which has an end face circumferentially extending about the axis of the rotary shaft;

a compressor housing fixed onto the second end portion of said center housing and having an impeller rotatably arranged therein and fixed onto the rotary shaft, said compressor housing having therein a compressed air passage located downstream of said impeller and including a diffuser and an air discharge chamber;

a turbine housing having a turbine wheel rotatably arranged therein and fixed onto the rotary shaft, said turbine housing having a radially outwardly extending annular flange which is arranged adjacent to the annular flange of the first end portion of said center housing and has an end face



circumferentially extending about the axis of the rotary shaft;

means for maintaining the end face of the annular flange of said turbine housing and the end face of the annular flange of said center housing in a contacting state to fix said turbine housing onto said center housing;

a closed annular air passage formed between the end face of the annular flange of said turbine housing and the end face of the annular flange of said center housing;

an air inflow passage interconnecting said compressed air passage to said annular air passage for feeding air into said annular air passage from said compressed air passage, and;

an air outflow passage connected to said annular air passage for discharging the air from said annular air passage.

4,376,618

ELECTROMAGNETIC PLUNGER PUMP

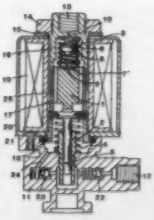
Akira Toyoda; Shizuo Arima, both of Tokyo; Katsumi Nozawa, and Kenji Igarashi, both of Yokohama, all of Japan, assignors to Taisan Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,235

Claims priority, application Japan, Dec. 6, 1980, 55-174395

Int. Cl.³ F04B 17/04

U.S. Cl. 417—417 **5 Claims**



3. An electromagnetic plunger pump including an electromagnetic plunger means which is pressure-supported in a

balance positioned by an opposed pair of springs, means responsive to an application of an intermittent electromagnetic force for causing said plunger means to make a reciprocal motion in the vertical direction, valve body means loosely fitting into one end portion of said electromagnetic plunger, said body engaging a a valve seat to close a discharge passage during pump shut-down and to open said valve seat and said discharge passage during pump operation.

4,376,619

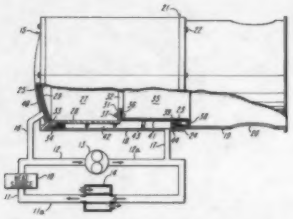
ACCUMULATOR-RESERVOIR DEVICE DIAPHRAGM CONTROL

Frederick W. Haushalter, Kenton, and Thomas J. Lord, Dayton, both of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Continuation of Ser. No. 742,419, Nov. 17, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,144

Int. Cl.³ F04B *11/00*

U.S. Cl. 417—540 **6 Claims**



1. In a substantially closed fluid circulating system, a pump which when in operation circulates fluid under pressure, said pump having inlet and outlet sides having regard to the direction of flow of fluid therethrough, said inlet and outlet sides representing respectively suction and pressure sides of the pump, an accumulator-reservoir device of the bootstrap type, a connection from said device to apply a fluid pressure to the suction side of said pump, a connection to said device from the pressure side of said pump to generate in said device during operation of said pump the fluid pressure applied to the suction side of said pump and to maintain fluid pressure in the system during operation of the pump, said device including a housing and a sliding piston in said housing in frictional contact with an interior wall thereof, oppositely directed portions of said piston being exposed to communicate with said system respectively at the suction side of said pump and at the pressure side thereof, and a spring independent of said pump in said housing and acting on the said piston portion exposed to communicate with said system at the pressure side of said pump to maintain at least a minimal above ambient fluid pressure in said system while said pump is not operating, said spring having a force sufficient to overcome frictional resistance to movement of said piston during nonoperating conditions of said pump but which force does not significantly affect movements of the piston in an operational mode of the system during which the pump is operating.

4,376,620

SEAWATER HYDRAULIC VANE-TYPE MOTOR

John R. Colston, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

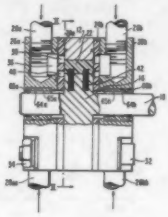
Filed Sep. 8, 1980, Ser. No. 184,682

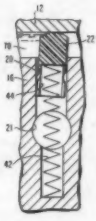
Int. Cl.³ F01C *19/08*; F03C *2/00*

U.S. Cl. 418—79 **9 Claims**

1. A vane type hydraulic motor operable with seawater as the hydraulic fluid, comprising a centralized ring member having an eccentric ring track interior surface with a major and minor diameter portion, a rotor disposed within the ring, said rotor having a central axially extending shaft and a plurality of spaced apart circumferential slots for accepting vanes in the perimeter of the rotor;

spring loaded vanes disposed in said rotor slots, which vanes are biased outward against the ring track in sliding seal relation to the ring track wherein the spring loaded vanes are generally rectangular members having an arcuate outer end portion which serves as a sliding seal against the ring track, the base of the vane members has at least one spring receiving aperture therein, the vane member has side faces normal to the direction of rotor rotation, which side faces include grooves which extend along the entire extent of the opposed side faces in a non-radial direction normal to the direction of rotation, with a radially extending slot extending from the side face grooves to the base of the vane;





a pair of flexible side seal plates disposed on either side of the rotor and ring in sliding seal and thrust bearing relationship with the rotor and shaft, which flexible side seal plates have hydraulic fluid inlet and outlet passages;

a pair of end plates sealable to the side seal plates with fluid inlet and outlet ports and communicating end plate passages aligned with side seal plate passages to permit high pressure hydraulic fluid to be introduced into the space between the rotor and ring track at the ramps where the vanes follow the ring track from the minor to major diameter, and to permit low pressure flow to exit from the space between the rotor and ring track at ramps where the vanes follow the ring track from the major to minor diameter.

4,376,621

METHOD AND APPARATUS FOR TUBE EXTRUSION

William A. Bridge, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

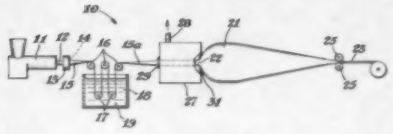
Continuation-in-part of Ser. No. 783,251, Mar. 31, 1977, abandoned. This application May 22, 1978, Ser. No. 908,347

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—72 R **1 Claim**

1. An apparatus for the production of synthetic resinous thermoplastic tube, the apparatus comprising in cooperative combination a source of heat-plastified synthetic resinous film-forming material in operative combination with an annular tubing die adapted to extrude a heat-plastified stretchable tube of the synthetic resinous material, at least one pair of nip rolls

in opposed spaced relation to the extrusion die, the nip rolls being adapted to receive and collapse a stretched heat-plastified tube from the extrusion orifice and maintain gas trapped therein to thereby form a bubble having a head end generally adjacent the extrusion die, the improvement which comprises means to provide a subatmospheric pressure externally to a tube being extruded and stretched over a trapped volume of gas disposed between the extrusion orifice and the nip rolls, the means to provide a subatmospheric pressure being disposed between the head end of the bubble and the die, the subatmo-



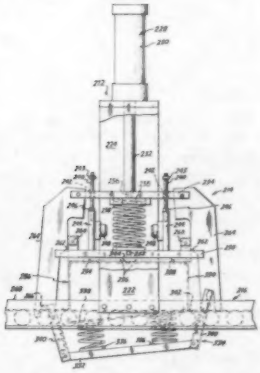
spheric pressure being applied only to a region of initial stretching of the tube to form a trapped bubble and unstretched tube whereby the subatmospheric pressure promotes initial stretching of the tube; wherein the means to provide a subatmospheric pressure comprises a chamber having a first or entry end and a second or exit end and a gas seal at each end, the gas seal at the exit end comprising a plurality of circularly arranged rolls having their axes disposed in a plane generally normal to the axes of the chamber whereby the rolls minimize friction of the tube against the chamber and leakage of air into the chamber.

4,376,622

MOLD OPENING AND HANDLING APPARATUS

Theodore E. Coffey, Pennsauken, N.J., assignor to Meat Management, Inc., Pennsauken, N.J.

Filed Oct. 31, 1980, Ser. No. 201,869
Int. Cl.³ B29C *1/16, 7/00*
U.S. Cl. 425—139 **11 Claims**



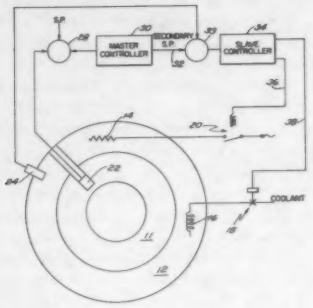
1. Apparatus for opening a mold which includes a body section, having an opening and a curled rim, and a closure section, having a lid removably applied to the opening of the body section, a crossbar resiliently urged away from the lid, a first ratchet hingedly connected to the crossbar so as to releasably engage the rim of the body section when the lid of the closure section is applied to the opening of the body section and a second ratchet hingedly connected to the crossbar so as to releasably engage the rim of the body section when the lid of the closure section is applied to the opening of the body section, said apparatus comprising arranging means for arranging the mold such that the body section is above the closure section during the opening of the mold; urging means for urging the crossbar of the closure section towards the lid of the closure section; first pivoting means for automatically pivoting the first ratchet of the closure section out of engagement with the rim of the body section when the crossbar is urged towards the lid by said urging means; second pivoting means for automatically pivoting the second ratchet of the closure section out of engagement with the rim of the body section when the crossbar is urged towards the lid by said urging means; first pushing means for pushing a first end of the closure section away from the body section after the first and second ratchets are disengaged from the rim of the body section; second pushing means for pushing a second end of the closure section away from the body section after the first and second ratchets are disengaged from the rim of the body section and after the first end of the closure section is pushed away from the body section; ejecting means for ejecting an article from the body section after the closure section has been pushed away from the body section by said first and second pushing means; catching means movable between a first position in which said catching means catches the closure section after the closure section has been pushed away from the body section by said first and second pushing means and in which said catching means discharges therefrom an article ejected from a previously opened mold and a second position in which said catching means catches the article ejected from the body section by said ejecting means and in which said catching means discharges the closure section caught by said catching means when said catching means was in said first position; and moving means for moving said catching means between said first and second positions.

8. Apparatus for opening a mold which includes a body section, having an opening and first and second coil springs releasably attached to the body section, and a closure section, having a lid removably applied to the opening of the body section and first and second retainers which releasably engage the first and second coil springs, respectively, when the lid of the closure section is removably applied to the opening of the body section, said apparatus comprising arranging means for arranging the body section above the closure section during the opening of the mold; pivoting means for automatically pivoting the first and second coil springs out of engagement with the first and second retainers, respectively; first pushing means for pushing a first end of the closure section away from the body section after the first and second coils springs are disengaged from the first and second retainers, respectively; second pushing means for pushing a second end of the closure section away from the body section after the first and second coil springs are disengaged from the first and second retainers, respectively, and after the first end of the closure section is pushed away from the body section; ejecting means for ejecting an article from the body section after the closure section has been pushed away from the body section by said first and second pushing means; catching means movable between a first position in which said catching means catches the closure section after the closure section has been pushed away from the body section by said first and second pushing means and in which said catching means discharges therefrom an article ejected from a previously opened mold and a second position in which said catching means catches the article ejected from the body section by said ejecting means and in which said catching means discharges the closure section caught by said catching means when said catching means was in said first position; and moving means for moving said catching means between said first and second positions.

4,376,623
EXTRUDER WITH TEMPERATURE CONTROL

James E. Robinson, Johnston, R.I., and Eric I. Siwko, Marlboro, Mass., assignors to The Entwistle Company, Hudson, Mass.

Filed Oct. 8, 1981, Ser. No. 309,460
Int. Cl.³ B29B 1/06
U.S. Cl. 425—143 2 Claims

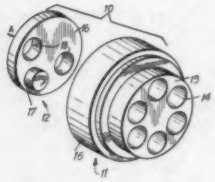


1. A plastic extruder having an inner barrel and an outer sheath thereabout, heating means for said sheath, cooling means for said sheath, means thermally controlling the temperature of the inner barrel comprising a master thermal sensing device on said barrel, a slave thermal sensing device on said sleeve, control circuitry connected to both sensing devices to selectively actuate the heating means and the cooling means to maintain a temperature gradient between the two sensors, said circuitry sensing the temperature change from the master sensing device and readjusting the set point of the slave device.

4,376,624
EXTRUSION DIE FOR A PASTA-MAKING KITCHEN APPLIANCE

Harold Osrow, Dix Hills, and Elliott Shulman, East Northport, both of N.Y., assignors to Osrow Products Corporation, Old Bethpage, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,576
Int. Cl.³ A21C 3/04, 9/00, 11/16; B29D 23/04
U.S. Cl. 425—464 19 Claims



1. An extrusion die for mounting across the path in which a farinaceous material is confined to travel during its expulsion in a predetermined direction from a kitchen appliance, especially from a pasta-making appliance for household use,

comprising a bipartite assembly consisting of:

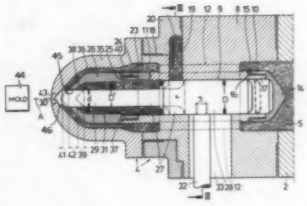
a first member extending across said path and including a perforated portion of one-piece with the first member, said perforated portion having an upstream and a downstream surface and a plurality of apertures extending between said surfaces substantially parallel to said direction in the mounted position of the extrusion die; and

a second member including a support portion disposed adjacent to said perforated portion at one of said surfaces thereof, and at least one projecting portion extending from said support portion, in a one-to-one relationship, into one of said apertures of said perforated portion in the assembled condition of said members, said support portion and said projecting portion being of one-piece with the second member, whereby access to the apertures and at least one projection portion for cleaning purposes is obtained solely by disassembly of the two members, thereby avoiding the laborious and cumbersome disassembly of multi-part extrusion die arrangements for cleaning purposes.

4,376,625
INJECTION-MOLDING APPARATUS FOR MAKING OBJECTS OF TWO DIFFERENT RESINS

Helmut Eckardt, Hilchenbach, Fed. Rep. of Germany, assignor to Battenfeld Maschinenfabrik GmbH, Meinerzhagen, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,429
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025597
Int. Cl.³ B29F 1/03
U.S. Cl. 425—564 11 Claims



1. An injection-molding apparatus for forming objects of two different resins, said apparatus comprising:

a nozzle extending along an axis and having a tubular and axially centered outer nozzle part forming an axially forwardly opening outlet and a tubular and axially centered inner nozzle part fixed axially behind said outer part and forming therewith an annular port immediately axially behind said outlet and formed with a central axially forwardly opening port axially fixed behind and surrounded by said annular port;

respective plastifying means for feeding respective and different plastified synthetic resins under pressure to said ports; and

an axially displaceable valve needle in said nozzle and snugly fittable in said central port, said needle being displaceable relative to both of said nozzle parts

from a fully forward position extending axially forward through said central port past said inner nozzle part into engagement with said outer nozzle part at said outlet and blocking both of said ports,

through a partially back position in and blocking only said central port,

to a fully back position clear of both of said ports, whereby in said fully forward position no resin can enter said nozzle, in said partially back position resin can enter said nozzle only from said annular port, and in said fully back position resins can enter said nozzle through both of said ports.

4,376,626
DEVICE FOR THE CONTROL OF A SEQUENTIAL BURNER OF A COOKING APPARATUS

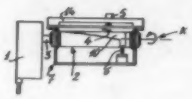
Alphonse Rossi, Thionville Guentrange, and Gerard Klammers, Thionville Garche, both of France, assignors to Etablissements Eugene Scholtes, Lagrange-Thionville, France

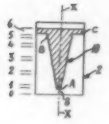
Filed Oct. 9, 1980, Ser. No. 195,511

Claims priority, application France, Oct. 9, 1979, 79 25055; Jan. 25, 1980, 80 01609

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—66 **11 Claims**





1. Control device for at least one sequential burner of a cooking apparatus, characterised in that it comprises in combination:

a geared-down synchronous motor and a drum which can be driven in rotation by this motor,

an electric circuit associated with this drum, comprising at least one electric contact pressing upon the surface of the drum and at least one electrically conductive track arranged on the drum in such manner as to permit operation of the burner according to heating sequences which are variable as a function of the position of the electric contact on the drum, and

means for adjusting the position of the contact in relation to the conductive track in order that the duration of the heating sequences of the burner may be varied progressively and continuously.

4,376,627
BURNER ASSEMBLY WITH PARALLEL PASSAGES FOR FUEL AND OXIDIZING GAS

Siegfried Förster, Alsdorf; Manfred Kleemann, Bergheim; Peter Quell, and Berthold Sack, both of Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 134,797

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912517; Mar. 29, 1979, 2912518

Int. Cl.³ F24C *3/10*; F23D *13/12*

U.S. Cl. 431—192 **6 Claims**

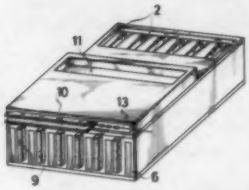
1. A burner comprising at least one burner head formed with a ceramic body having two sets of interdigitated parallel passages, the passages of one of said sets opening at one end of said body at a burner mouth, the passages of said sets being separated from one another by liquid-fuel-permeable partitions whereby liquid fuel delivered to the passages of the other of said sets penetrates said partitions and forms a film on the walls of the passages of said one set;

means for feeding an oxidizing agent gas through said passages of said one set for evaporation of said film to form a mixture with the fuel;

means for supplying said fuel in liquid form to the passages of said other set; and

an ignition device disposed at said mouth, said ignition device comprising

an elongated porous body extending across said passages at said mouth and formed with a cavity,



means for feeding liquid fuel to said elongated body whereby a film of the fuel is formed in said cavity,

an ignition wire extending through said cavity and energizable for igniting the fuel film therein, and

bores formed in said elongated body for communicating ignition to a combustible mixture ahead of said mouth.

4,376,628
DEVICE FOR TREATING TEETH

Henri J. Aardse, Hilversum, Netherlands, assignor to B.V. Gaba, Hilversum, Netherlands

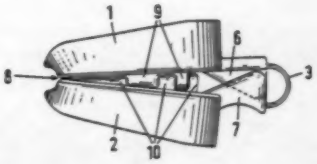
PCT No. PCT/NL80/00016, § 371 Date Jan. 9, 1981, § 102(e) Date Jan. 9, 1981, PCT Pub. No. WO80/02368, PCT Pub. Date Nov. 13, 1980

PCT Filed May 9, 1980, Ser. No. 230,948

Claims priority, application Netherlands, May 9, 1979, 7903648

Int. Cl.³ A61C *17/02*

U.S. Cl. 433—80 **5 Claims**



1. A device for treating teeth with a tooth treating medium, such as a fluorine-containing agent, comprising two substantially U-shaped trough members made of soft synthetic plastics material, one of said trough members being designed to be applied about the upper teeth and the other about the lower teeth, said members being interconnected by at least one flexible connector, characterized in that the two U-shaped members are interconnected by a single centrally located projecting connector element, provided centrally in the plane of symmetry of each of the two members and connecting with said members at the trough bottoms with the centrally located single connector element projecting forwardly from the mouth when said two trough members are positioned to be placed on the teeth to provide a forwardly projecting handle to enable the device to be hygenically handled by the operator without entering the cavity of the mouth, said connector element being provided with means for centering the two U-shaped members relatively to each other, including two sets of centering ridges extending in a direction parallel to said plane of symmetry with the two sets of ridges intermeshing when said two trough members are positioned to be placed on the teeth, each of said

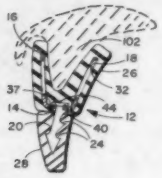
ridges being bevelled in the direction of the adjacent U-shaped members.

4,376,629

FLEXIBLE DENTURES

Edwin Ebeling, 2706 E. 57th St., Long Beach, Calif. 90805

Filed Oct. 1, 1981, Ser. No. 307,193
Int. Cl.³ A61C *13/08*
U.S. Cl. 433—200 **10 Claims**



1. A denture comprising a frame formed from flat spring steel stock and having a curved base from one side of which pairs of diverging flanges extend at each tooth position, pins secured to said base and extending therethrough to the opposite side thereof at each missing tooth position through configured apertures in said base which prevent said pins from rotating relative to said base, each pin having at least one barb thereon, a soft, resilient, flexible plastic coating encasing said spring steel frame, and an artificial tooth mounted on each of said pins whereby the artificial teeth are held on said pins by said barbs.

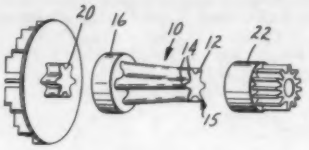
4,376,630

DRIVE COUPLING

Wilbur J. Hampel, Spring Park, and Dana R. Lonn, Minneapolis, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 21, 1980, Ser. No. 179,968
Int. Cl.³ F16D *3/64*
U.S. Cl. 464—88 **5 Claims**

1. A drive coupling comprising an integral rubber article having a solid elongate body section having a plurality of longitudinal ribs therealong, wherein said ribs are spaced equidistantly around the periphery of said body section and are parallel to each other such that one end of said body section is suited to be inserted into a complementarily shaped grooved bore of a driven member in a splined driving relationship, the other end of said body section being of larger diameter and having a grooved recess therein which is adapted to sildably receive a drive member in a splined driving relationship, wherein the axis of said



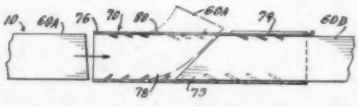
elongated body section, and wherein the rubber material of which said body section is made has a Shore A hardness of at least 75.

4,376,631

TEMPORARY FAN BELT REPLACEMENT FOR EMERGENCY PURPOSES ON MOTOR VEHICLES

Robert L. Garza, Toledo, Ohio, assignor to James Schuster, Pueblo West, Colo.

Filed Sep. 15, 1980, Ser. No. 186,907
Int. Cl.³ F16G *11/08*
U.S. Cl. 474—255 **2 Claims**



2. A temporary replacement for a fan belt for motor vehicles comprising in combination:

(a) an open-ended belt member, having two opposing ends; specifically a first end and a second end;

(b) a buckle member on the first end of such belt member, said buckle having a cross-sectional configuration and girth substantially identical to other portions of said belt member; said buckle member having an internal channel therein such channel adapted to receive the second end of said belt member;

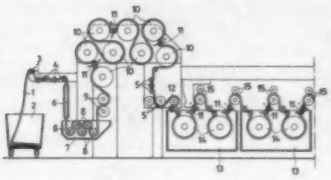
(c) locking means on said buckle member to lock said second end of said belt member in said buckle channel, said locking means comprising a sliding knife-like member adapted to engage a portion of the second end of said belt member.

4,376,632

PROCESS AND PLANT FOR THE CONTINUOUS MERCERIZATION OF RAW OR COLORED OPEN OR TUBULAR KNITTED FABRIC

Vittorio Codecasa, Milan, Italy, assignor to E. Mottana S.p.A., Milan, Italy

Continuation of Ser. No. 92,407, Nov. 8, 1979, abandoned. This application Dec. 29, 1981, Ser. No. 335,419
Int. Cl.³ D06M *1/02*; D06F *31/00*
U.S. Cl. 8—125 1 Claim



1. A process for continuously mercerizing raw or colored open or tubular knitted fabric according to the following series sequence of successive operational steps:

(a) passing such fabric under controlled tension condition through a caustic soda solution thereby impregnating the fabric with such caustic soda;

(b) subjecting the impregnated fabric to a reaction phase by removing the impregnated fabric from the caustic soda solution and passing at least a first side of such impregnated fabric along an undulating path in supported relationship over a series of one or more pairs of stabilizing rollers and a second side of the impregnated fabric under a tension sensor disposed between such a pair of stabilizing rollers whereby under controlled tension with such impregnated fabric is being exposed to air during which time the caustic soda reacts with the fabric with the tendency to shrink the fabric longitudinally and transversely;

(c) controlling the tension of the fabric during the reaction phase by such tension sensors positioned between the pairs of the stabilizing rollers whereby the tendency of the caustic soda to shrink the fabric longitudinally and transversely during the reaction phase is effectively offset by the controlled tension applied to the fabric;

(d) passing the fabric through a series of at least five wash stages of which the first four are of the automatically controlled tension type and washing, stabilizing, and neutralizing the fabric during passage through such wash stages;

(e) deep wringing and collecting the fabric in the case of raw fabric, or alternatively deep wringing and sizing the fabric followed by deep wringing in the case of colored fabric.

4,376,633

ZWITTERION COMPOUNDS AS CATALYSTS IN EASY-CARE FINISHING

Robert M. Reinhardt, and Donald J. Daigle, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 272,842
Int. Cl.³ D06M *15/54*, *15/58*, *15/56*
U.S. Cl. 8—184 9 Claims

1. A process for the finishing of cellulosic fabrics to produce easy-care textiles, said process comprising:

(a) treating the fabric by impregnating with a solution containing a cellulose-crosslinking agent, and a zwitterion,

(b) drying the fabric, and

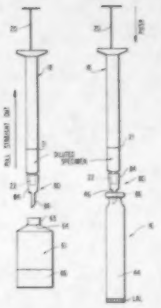
(c) curing the fabric.

4,376,634

ASSAY KIT HAVING SYRINGE, DILUTION DEVICE AND REAGENTS WITHIN SEALED CONTAINER

Richard B. Prior, Westerville, and Vincent A. Spagna, Dublin, both of Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 154,762, May 30, 1980, abandoned. This application Mar. 9, 1981, Ser. No. 241,859
Int. Cl.³ G01N *33/50*
U.S. Cl. 436—502 42 Claims



1. A diagnostic kit comprising

(a) a syringe having a tip with an opening for extracting a specimen to be tested under negative pressure and expelling said specimen under positive pressure;

(b) a sealed dilution device containing a preselected quantity of sterile, pyrogen-free diluent for diluting said specimen, said dilution device having an opening for providing access to said sterile, pyrogen-free diluent;

(c) a needle fixable to the tip of said syringe; and

(d) a vial containing reagents for an assay, said vial having a septum penetrable by said needle;

wherein said tip is engageable with said dilution device for receiving sterile, pyrogen-free diluent from said dilution device and said needle is of a sufficient length to pass through said septum and provide a path to said reagents for an assay contained in said vial for diluted specimen.

4,376,635

NOVEL GASOHOL OR ETHANOL FUEL COMPOSITION CONTAINING AS A CORROSION INHIBITOR THE REACTION PRODUCT OF BENZOTHIAZOLE, FORMALDEHYDE AND AN N-ALKYL PROPYLENE DIAMINE

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,527
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—56 38 Claims

1. A fuel composition for internal combustion engines comprising

(a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0-50 volumes per volume of alcohol; and

(b) a minor corrosion inhibiting amount of, as a corrosion inhibiting agent, a reaction product of (i) a benzotriazole, (ii) an aldehyde or a ketone, and (iii) a C_3–C_{12} poly-primary amine bearing at least one free —NH_2 group and at least one —NHR′ group wherein R′ is a C_{12}–C_{18} hydrocarbon group.

4,376,636

FUEL ADDITIVE

Theodor Weinberger, Charlotte, N.C., assignor to Adriel Energy Corporation, McLean, Va.

Filed Nov. 18, 1981, Ser. No. 322,581
The portion of the term of this patent subsequent to Dec. 1, 2000, has been disclaimed.
Int. Cl.³ C10L 1/18
U.S. Cl. 44—56 15 Claims

1. A gasoline additive mixture consisting essentially of alcohol mixed with from about 3 to about 40 percent, based on the volume of said alcohol, a ketone having the general formula

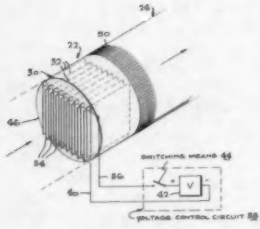
wherein R_1 and R_2, which may be the same or different, are each an alkyl of 1 to 4 carbon atoms, and from about 0 to about 1.5 grams per gallon of said additive mixture of an alkali metal carbonate in finely divided form.

4,376,637

APPARATUS AND METHOD FOR DESTRUCTIVE REMOVAL OF PARTICLES CONTAINED IN FLOWING FLUID

Lien C. Yang, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 14, 1980, Ser. No. 196,877
Int. Cl.³ B03C 3/01, 3/88; F01N 3/38
U.S. Cl. 55—2 39 Claims



1. An apparatus for removing particles from a flowing gas containing said particles comprising:

means for so directing the flowing gas as to pass said particles through a predetermined location; and

means for destructively removing said particles, said means being constructed and arranged to provide a spark discharge when said particles pass through said predetermined location.

39. A method for destructively removing particles from a flowing gas, wherein dimensional characteristics of said particles are known, the steps comprising:

locating a plurality of conductors so that they are spaced apart to form a spark discharge grid;

directing said flowing gas so that said particles contained therein will pass between said conductors; causing a concentration of said particles to accumulate between said conductors; and

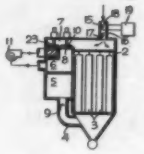
applying a voltage between adjacent ones of said conductors to generate an electric spark discharge initiated by said concentration of particles located between said conductors, said electric spark discharge destructively removing a portion of said particles.

4,376,638

METHOD AND APPARATUS FOR CHARGING A FILTER COMPARTMENT TO ISOLATE THE COMPARTMENT WITHIN A BAGHOUSE INSTALLATION

S. Michael Dunseith, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 9, 1981, Ser. No. 310,132
Int. Cl.³ B01D 46/04
U.S. Cl. 55—20 7 Claims



1. In a method for isolating a filter compartment in a baghouse installation having a plurality of parallel filter compartments wherein hot dirty gases containing corrosive agents flow through an inlet in each of the filter compartments from a common inlet manifold maintained at a pressure below ambient pressure, and wherein the dirty gases are filtered through a plurality of filter bags as they flow through each of the compartments and ultimately flow out of the compartments through an outlet in each of the compartments into a common outlet manifold, the improvement comprising closing the inlet and outlet of said compartment to prevent the flow of dirty gases into the compartment, and thereafter heating a stream of ambient air to a temperature near the dew point temperature of the corrosive agents in the dirty gases and admitting it into said compartment to form a pressure barrier within said compartment, thereby essentially eliminating seepage of dirty gases through the closed inlet and outlet of said compartment while minimizing condensation of said agents within said compartment.

7. A baghouse installation for cleaning a stream of hot dirty gases containing corrosive agents comprising:

a plurality of parallel filter compartments, a gas inlet and a gas outlet opening into each of said compartments accommodating the flow of the gas stream through the compartments, and a plurality of filter bags mounted within the compartments adapted to filter the gas stream as it flows through the compartments;

a common inlet manifold connected with each of said inlets for receiving the dirty gas stream and directing it into the filter compartments;

a common outlet manifold connected with each of said outlets for conveying the filtered gases away from the compartments;

blower means connected with said outlet manifold to draw the gases through the compartments at a subatmospheric pressure;

normally open inlet and outlet damper means in the gas inlet and the gas outlet, respectively, of each of the compartments for closing off the inlet and outlet of a predetermined number of the compartments to isolate said compartments within the baghouse installation while accommodating the flow of gases through the remaining compartments;

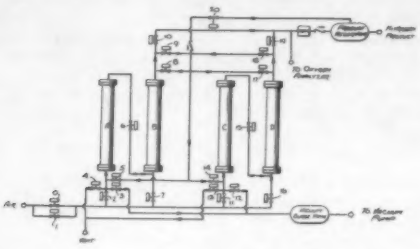
an air damper assembly connected with each compartment for venting the isolated compartments to the atmosphere to establish a flow of ambient air into each of said compartments to form a pressure barrier within said compartments essentially eliminating seepage of flue gases through the closed inlet; and

air heating means connected with said air damper assembly for heating the ambient air as it enters the isolated compartments to a temperature above the dew point temperature of the corrosive agents in the dirty gases.

4,376,639
NOVEL REPRESSURIZATION OF PRESSURE SWING ADSORPTION SYSTEM

Toan P. Vo, Pittsburgh, Pa., assignor to Calgon Corporation, Robinson Township, Indiana County, Pa.

Filed Dec. 10, 1981, Ser. No. 329,144
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—26 **3 Claims**



1. An adsorption process for producing an enriched gas stream which comprises the sequential steps of:

(a) passing a gaseous mixture, at an adsorption pressure selected from the range of from 3.0 to 8.0 bars through a first adsorption zone comprising a first and a second column of carbon molecular sieves connected in series to yield enriched gas, said enriched gas flowing to a product reservoir;

(b) prior to breakthough, isolating said first column of the first adsorption zone, thereafter passing the gaseous mixture through solely the second column of said first adsorption zone, thereby producing lean gas and passing said lean gas from the second column of said first adsorption zone into the inlet end of a second adsorption zone comprising a first and a second column of carbon molecular sieves connected in series, to partially pressurize said second adsorption zone in the range of about 40 to 90% of said adsorption pressure thereafter halting said lean gas flow;

(c) further pressurizing of said second adsorption zone to said adsorption pressure by introducing enriched gas from said product reservoir into the outlet end of said second adsorption zone;

(d) venting said isolated first column of the first adsorption zone to the atmosphere through its inlet end, and countercurrently venting the second column of said first adsorption zone thereby producing vented gas and using said vented gas to countercurrently purge the previously vented first column in the zone;

(e) passing said gaseous mixture through said fully pressurized second adsorption zone to yield enriched gas while regenerating said first adsorption zone by application of vacuum to the inlet end of said first zone in the range of 70 to 250 torr;

(f) repeating the sequence, steps (b)-(e) treating said second zone as said first zone and said first zone as said second zone.

4,376,640
REPRESSURIZATION OF PRESSURE SWING ADSORPTION SYSTEM

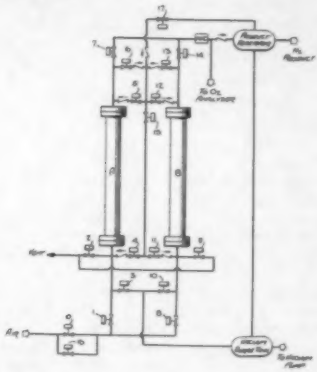
Toan P. Vo, Pittsburgh, Pa., assignor to Calgon Corporation, Robinson Township, Allegheny County, Pa.

Filed Dec. 10, 1981, Ser. No. 329,145
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—26 **5 Claims**

1. An adsorption process for producing an enriched gas stream of a predetermined purity which comprises the sequential steps of:

(a) passing a gaseous mixture, at an adsorption pressure selected from the range of from 3.0 to 8.0 bars through a first adsorption zone comprising one column of carbon molecular sieves to yield enriched gas passing said enriched gas to a product reservoir;

(b) when said enriched gas declines in purity by from 1 to 10 percent below said predetermined purity, thereby becoming lean gas, passing said lean gas from the outlet end of said first adsorption zone into the inlet end of a second adsorption zone comprising one column of carbon molecular sieves, to pressurize said second adsorption zone in the range of about 70 to 120% of said adsorption pressure, thereafter halting said lean gas flow and isolating said first adsorption zone;



(c) allowing said second adsorption zone to decrease in pressure via a time delay process while concomitantly venting said isolated first adsorption zone to the atmosphere through its inlet end;

(d) thereafter passing said gaseous mixture through said pressurized second adsorption zone at the adsorption pressure to yield enriched gas while regenerating said isolated and vented first adsorption zone by application of vacuum to the inlet end of said first zone in the range of from 70 to 250 torr;

(e) repeating the cycle, treating said second zone as said first zone when the enriched gas quality declines in purity by from 1 to 10 percent below said predetermined purity.

4,376,641
COATED CAPILLARY CHROMATOGRAPHIC COLUMN

Terry J. Nestrick; Thomas L. Peters, and Lester L. Lamparski, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1981, Ser. No. 330,343
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **16 Claims**

1. In the process of preparing a chromatographic column using a glass capillary tube, the inner surface of which is etched and acid-activated, or fused silica capillary tube, the inner surface of which is acid-activated, the improved method of deactivating, the inner surface of the capillary which comprises:

(a) contacting the etched and/or acid-activated surface with $SiCl_4$ vapor thereby causing substantial chlorosilylation of said surface,

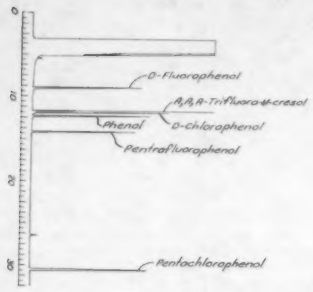
(b) contacting the chlorosilylated surface with water vapor until essentially all of the chlorosilyl groups have been hydrolyzed to hydroxysilyl groups,

(c) contacting the hydrolyzed surface with excess of a diorganodichlorosilane vapor of the formula $RR'SiCl_2$ where RR' each represent a methyl, ethyl, vinyl, or allyl radical, or a mono-chlorinated derivative thereof, to react at least

the major portion of the hydroxysilyl groups to form corresponding diorganochlorosilyl groups,

(d) contacting the reacted surface from step (c) with water vapor until essentially all of the diorganochlorosilyl groups have been hydrolyzed to diorganohydroxysilyl groups,

(e) contacting the hydrolyzed surface of step (d) with $SiCl_4$ vapor to react substantially all of said diorganohydroxysilyl groups to form diorganosilyloxychlorosilyl groups,



(f) repeating steps b–d not less than once, and

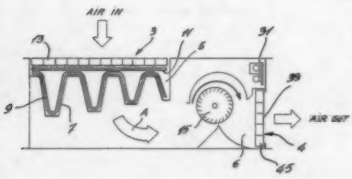
(g) contacting the final hydrolyzed surface from step (f) with a triorganochlorosilane vapor of the formula RR'R"SiCl where RR'R" each represent a methyl, ethyl, vinyl or allyl radical, or a mono-chlorinated derivative thereof, to convert substantially all diorganohydroxysilyl groups to corresponding triorganosilyloxydiorganosilyl groups.

4,376,642

PORTABLE AIR CLEANER UNIT

Nigel C. Verity, Dorval, Canada, assignor to Biotech Electronics Ltd., Dorval, Canada

Continuation-in-part of Ser. No. 159,841, Jun. 16, 1980, abandoned. This application Mar. 9, 1981, Ser. No. 241,517
Claims priority, application Canada, Aug. 18, 1980, 358492
Int. Cl.³ B03C *3/01, 3/12, 3/32*
U.S. Cl. 55—105 **14 Claims**



1. An air cleaner unit comprising:

a casing having an air inlet and an air outlet and defining an air cleaning path between said air inlet and said air outlet;

filter means disposed across said path between said air inlet and said air outlet and comprising fibers shredded or fibrillated from a non-carcinogenic plastic membrane which has been permanently electrostatically charged;

air moving means disposed along said path for moving the air from said air inlet to said air outlet;

an exposed negative ion source disposed on the external surface of said air outlet; and

a power supply connected to the negative ion source, the power supply having means for limiting the current of said power supply to protect users from receiving hazardous electrical shocks from said exposed negative ion source.

8. An air cleaner unit comprising:

a casing having an air inlet and an air outlet and defining an air flow path between said air inlet and said air outlet;

a grill covering the air outlet;

air moving means disposed along said path for providing an air flow from said air inlet to said air outlet;

filter means disposed across said path between said air inlet and said air outlet, said filter means comprising a plurality of electrically charged fibers for efficiently cleaning the air flowing from the air inlet to the air outlet; and

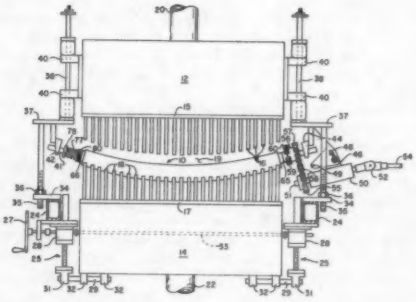
a negative ion source located at said grill for producing ions of the cleaned air, said ion source being exposed at the air outlet for providing substantial emission of said ions into the air external to the grill without impediment from charge build-up on the grill.

4,376,643

APPARATUS FOR CONVEYING GLASS SHEETS

Lisa M. Kahle, Altoona, and Stephen J. Schultz, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1981, Ser. No. 306,027
Int. Cl.³ C03B *27/04*
U.S. Cl. 65—351 **13 Claims**



1. In a conveyor roll for conveying glass sheets comprising:

(a) a curved rigid shaft having at least a portion thereof provided with an elevational shape conforming to the transverse shape of the glass;

(b) means for supporting said curved shaft at its ends so that said curved portion extends transversely of a path of movement for said glass sheets;

(c) a plurality of segments of essentially cylindrical configuration mounted around said curved shaft in end to end relation with one another from one end segment at one end of said plurality of segments to another end segment at the other end of said plurality of segments, said segments having loosely interfitting tongues and grooves at the axial ends of adjacent of said segments that form loose interfitting tongue and groove couplings capable of transmitting a torque between adjacent of said segments while permitting a limited freedom of axial movement between said adjacent segments;

(d) means for applying a torque to one of said end segments; and

(e) means mounted around said shaft in position to apply a biasing pressure against the other of said end segments to bias said segments in an axial direction sufficiently to retain a loosely fitting relation between said tongues and grooves and to enable said segments to transmit a torque applied to said one end segment through said segments to said other end segment, whereby when said segments rotate, said biasing means tends to mar the outer axial surface of said end segment and to cause a drag on the rotation of said roll,

the improvement comprising a thrust bearing mounted

around said shaft and interposed between the outer axial surface of said end segment and said biasing means to protect said outer axial surface from said marring and to permit the application of said biasing pressure on said end segment while minimizing said drag.

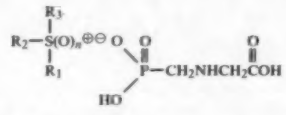
4,376,644

TRI-MIXED ALKYLSULFONIUM SALTS OF N-PHOSPHONOMETHYLGLYCINE AND THEIR USE AS PLANT GROWTH REGULATORS AND HERBICIDES

George B. Large, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

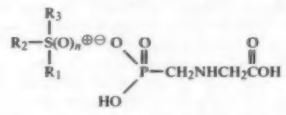
Continuation-in-part of Ser. No. 212,921, Dec. 4, 1980, Pat. No. 4,315,765. This application Nov. 25, 1981, Ser. No. 324,284
The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.
Int. Cl.³ C07F 9/38; A01N 57/00
U.S. Cl. 71—87 33 Claims

1. A compound having the formula



wherein R_1, R_2, and R_3 represent C_1–C_6 alkyl, and n is zero or one, wherein no more than two of R_1, R_2 or R_3 are identical.

15. A method of controlling undesirable vegetation comprising applying to the vegetative in post-emergent state an herbicidal composition comprising an herbicidally effective amount of a compound having the formula



where R_1, R_2, and R_3 represent C_1–C_6 alkyl, and n is zero or one, wherein no more than two of R_1, R_2 or R_3 are identical, and an inert diluent carrier.

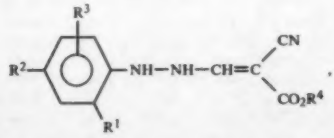
4,376,645

2'-PHENYLHYDRAZINO-2-CYANOACRYLIC ACID ESTERS AND HERBICIDES CONTAINING THESE COMPOUNDS

Karl Eicken, Wachenheim; Peter Plath, Ludwigshafen, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

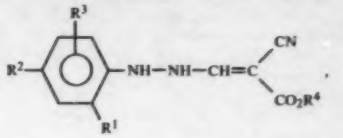
Filed Nov. 18, 1981, Ser. No. 322,674
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045903; Jul. 4, 1981, 3126479
Int. Cl.³ A01N 37/34; C07C 121/78
U.S. Cl. 71—105 6 Claims

1. A 2'-phenylhydrazino-2-cyanoacrylic acid ester of the formula



where R^1 is chlorine or bromine, R^2 is chlorine, bromine or iodine, R^3 is chlorine or bromine, and R^4 is alkyl of 1 to 3 carbon atoms, allyl or propargyl.

4. A process for combating unwanted plants, wherein the plants or the soil are treated with a 2'-phenylhydrazino-2-cyanoacrylic acid ester of the formula



where R^1 is methyl, trifluoromethyl, chlorine or bromine, R^2 is chlorine, bromine, iodine or methylsulfonyl, R^3 is hydrogen, chlorine or bromine, or methoxy in the 5-position, in which case R^1 and R^2 are chlorine, or R^3 is chlorine in the 3-position, in which case R^2 is hydrogen, and R^4 is alkyl of 1 to 3 carbon atoms, allyl or propargyl.

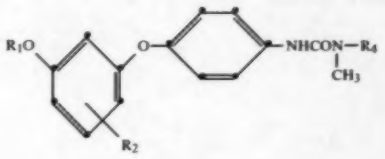
4,376,646

HERBICIDAL N-[4-(3'-ALKOXYPHENOXY)-PHENYL]-N'-METHYLUREAS

Otto Rohr, Therwil, Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,295
Claims priority, application Switzerland, Mar. 18, 1980, 2123/80; Mar. 18, 1980, 2124/80
Int. Cl.³ A01N 9/20; C07C 127/19
U.S. Cl. 71—120 17 Claims

1. A compound of the formula



wherein
R_1 is a straight-chain or branched-chain C_1–C_6-alkyl group,
R_2 is hydrogen, halogen, methyl or methoxy, and
R_4 is methyl or methoxy.

15. A method for selectively combatting undesirable plant growth in cultivated crops of wheat, which comprises applying to the locus of said crops a herbicidally effective amount of a urea compound of claim 1, 5, 6, 10 or 11.

4,376,647

PROCESS FOR TREATING SULFIDE-BEARING ORES

Hong Y. Soha, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 82,198, Oct. 5, 1979. This application Feb. 17, 1981, Ser. No. 235,177
Int. Cl.³ C22B 1/02
U.S. Cl. 75—7 12 Claims

7. A process for removing sulfur from an ore from the group consisting of chalcopyrite and producing bornite comprising the steps of:

mixing lime with chalcopyrite;

adding water to said mixture;

heating the mixture such that water vapor reacts with the chalcopyrite to form hydrogen sulfide gas, thereby substantially removing the sulfur from the chalcopyrite; and

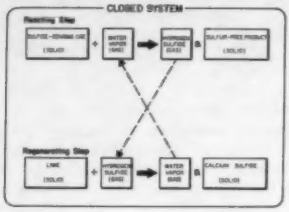
reacting the hydrogen sulfide gas with the lime to form calcium sulfide and water vapor so that substantially all of the sulfur is removed from a gaseous form, said water

vapor being capable of reacting with the chalcopyrite and separating the ore from the calcium sulfide.

11. A process for removing sulfur from an ore comprising molybdenum sulfide comprising the steps of:

mixing lime with molybdenum sulfide;

adding water to said mixture;



heating the mixture such that water vapor reacts with the molybdenum sulfide to form molybdenum oxide and hydrogen sulfide; and

reacting the hydrogen sulfide with the lime to form calcium sulfide and water so that substantially all of the sulfur is removed from a gaseous form, said water being capable of reacting with the molybdenum sulfide and separating the ore from the calcium sulfide.

4,376,648

PROCESS FOR PRODUCING REDUCED IRON

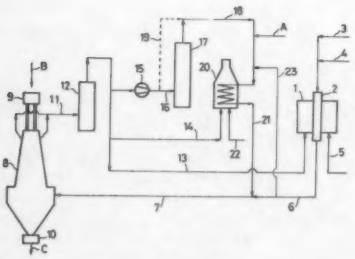
Kimiaki Ohtawa; Masahiro Tokuda, and Yasuo Fukada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 259,058

Claims priority, application Japan, Dec. 4, 1980, 55-170226

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—35 **2 Claims**



1. A process for producing reduced iron from iron ore by means of a reducing gas in a direct reduction plant including a shaft furnace which produces a furnace gas, a steam reformer and a reducing gas heating means, comprising the steps of:

producing a reducing gas from a gaseous hydrocarbon compound in said steam reformer,

heating, in said reducing gas heating means, at least a portion of said reducing gas from said steam reformer and/or at least a portion of said furnace gas after said portion of said furnace gas has been regenerated into a reducing gas,

supplying said reducing gas, including said heated portion or portions, to said shaft furnace,

supplying hydrogen sulfide or a material capable of producing hydrogen sulfide to said reducing gas from outside the system in an amount such that the concentration of hydrogen sulfide in said reducing gas as introduced into said shaft furnace is from 10 to 100 volume ppm, and

reducing said iron ore in said shaft furnace.

4,376,649

CONTINUOUS PROCESS OF SMELTING METALLIC LEAD DIRECTLY FROM LEAD-AND SULFUR-CONTAINING MATERIALS

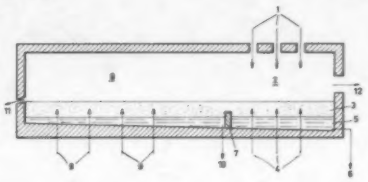
Werner Schwartz, Buchholz, and Peter Fischer, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,560

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029682

Int. Cl.³ C22B *13/06*

U.S. Cl. 75—78 **6 Claims**



1. In a continuous process of smelting metallic lead directly from lead- and sulfur-containing materials, said lead- and sulfur-containing materials containing at least one metal of the group tin, arsenic, antimony and zinc, in an elongated horizontal reactor, which materials also contain bismuth, wherein a molten bath consisting of a slag phase containing at least one metal of the group of tin, arsenic, antimony and zinc and a lead phase is maintained in the reactor, the charge is fed into the reactor at one end thereof onto the molten bath in a melting zone so as to maintain an oxidation potential in an oxidation zone which causes formation of a metallic lead phase and a slag phase containing at least one metal of the group tin, arsenic, antimony and zinc, reducing agent is introduced into the slag phase at the other end of the reactor in a reducing zone, and low-lead slag and metallic lead are tapped from their respective phases, the improvement wherein an oxidation potential is maintained in the molten bath in the melting zone such that the lead phase contains 0.05 to 2% by weight sulfur, a high-Bi primary crude lead which becomes available in the melting zone is separately tapped, and the low-Bi secondary crude lead which becomes available in the reducing zone is also separately tapped.

4,376,650

HOT WORKABILITY OF AN AGE HARDENABLE NICKLE BASE ALLOY

Robert L. McGinness, Charlotte, N.C., assignor to Teledyne Industries, Inc., Monroe, N.C.

Filed Sep. 8, 1981, Ser. No. 300,103

Int. Cl.³ C22C *33/00, 19/05*

U.S. Cl. 75—129 **11 Claims**

1. In a method for producing an age hardenable nickel base alloy containing 17 to 20 percent chromium, 2.9 to 5.3 percent titanium, 1.8 to 2.8 percent aluminum, 11 to 15.5 percent cobalt, 2.5 to 7 percent molybdenum, 0.8 to 1.5 percent tungsten, 0.004 to 0.040 percent boron, 0.02 to 0.06 percent carbon, and about 52 to about 57 percent nickel, and in which appropriate raw materials for producing an alloy of said composition are melted, refined, and thereafter cast into an ingot, the improvement which comprises improving the hot workability of the alloy by melting said appropriate raw materials under a vacuum in the presence of lime and forming a desulfurizing lime slag on the surface of the molten raw materials, and thereafter adding magnesium thereto just prior to casting.

4,376,651

PROTECTIVE COATING FOR FOUNDRY IMPLEMENTS WHICH CONTACT MOLTEN ALUMINUM ALLOYS

Igor Lanik, Boskovice; Otakar Havelka, Blansko, and Dusan Pirochta, Brno, all of Czechoslovakia, assignors to Vyzkumny ustav keramiky, Pilsen, Czechoslovakia

Filed Feb. 11, 1982, Ser. No. 347,917

Claims priority, application Czechoslovakia, Feb. 17, 1981, 1107-81

Int. Cl.³ B28B 7/36

U.S. Cl. 106—38.24 1 Claim

1. A protective coating for foundry implements which are in contact with molten aluminium alloys, comprising from 10 to 60 weight parts of extraction oil obtained by deasphalting and dewaxing heavy oils left after the vacuum distillation of crude oil having a kinematic viscosity of from 37 to 53 $mm^2.sec.^{-1}$ at 100° C. and an open cup flash point of at least 285° C.; from 5 to 30 weight parts of a mixture of light and middle oils obtained by the vacuum distillation of crude oils having a flash point of at least 150° C. and a viscosity of from 16 to 22 $mm^2.sec.^{-1}$ at 50° C.; from 1 to 15 weight parts of graphite, or from 0.1 to 5 weight parts of wool fat, and from 0.1 to 3 weight parts of ethoxylated fatty alcohols having from 12 to 18 carbon atoms and from 10 to 20 ethylene oxide units in the molecule and from 20 to 65 weight parts of titanium dioxide.

4,376,652

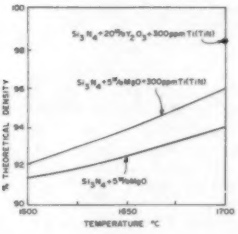
HIGH DENSITY HIGH STRENGTH Si_3N_4 CERAMICS PREPARED BY PRESSURELESS SINTERING OF AMORPHOUS Si_3N_4 POWDER AND TI

Sergej-Tomislav Buljan, Acton, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 8, 1979, Ser. No. 1,642

Int. Cl.³ C04B 35/58, 35/04, 35/50

U.S. Cl. 501—97 6 Claims



1. A powder mixture consisting essentially of amorphous Si_3N_4 powder of average particle size below about 3 microns characterized in that the Si_3N_4 powder contains about 100 to 1000 parts per million Ti.

4,376,653

PROCESS FOR THE PRODUCTION OF NICKEL, HIGH-PURITY MAGNESIUM OXIDE AND CEMENT

Nicholas P. Wynn, and Michal Zabelka, both of Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 9, 1982, Ser. No. 347,197

Claims priority, application Switzerland, Sep. 29, 1981, 6246/81

Int. Cl.³ C04B 7/02

U.S. Cl. 106—103 14 Claims

1. A process for the production of nickel, magnesium oxide and cement comprising the steps of

leaching an oxidic raw material containing nickel, magnesium and iron with sulphuric acid in a leaching stage at a temperature of up to 270° C. to obtain a mother liquor;

adding a first neutralization agent to the mother liquor to raise the pH of the mother liquor to a value between 5 and 7;

contacting the mother liquor with an organic metal extraction agent in a first extraction stage and adding a second neutralization agent to maintain a constant pH between 5 and 7 to separate heavy metals while retaining metal ions of the alkali-metals, alkaline-earth metals and magnesium in a depleted aqueous solution;

contacting the charged organic metal extraction agent with a mineral acid to strip nickel, cobalt and manganese therefrom in a metal solution;

recovering nickel from the metal solution;

contacting the depleted metal extraction agent with concentrated sulphuric acid to at least partially strip metals of the group consisting of copper, zinc and iron and obtain a sulphuric acid solution;

removing at least a portion of the sulphuric acid solution for the production of cement;

reacting the depleted aqueous solution with carbon dioxide and ammonia in a reactor at a pH of between 7 and 8.5, a temperature below 100° C. and a magnesium sulphate concentration of less than 25% to precipitate magnesium carbonate or hydroxy carbonate and to form an ammonium sulphate solution;

separating the precipitated magnesium carbonate from the ammonium sulphate solution;

calcining the separated magnesium carbonate in a calcining stage to form magnesium oxide and carbon dioxide;

re-cycling the formed carbon dioxide to the reactor;

adding quicklime to the separated ammonium sulphate solution to form a gypsum slurry and to liberate ammonia;

re-cycling the liberated ammonia to the reactor;

drying and firing the gypsum slurry in a cement making stage to form a cement clinker while liberating a sulphur dioxide containing gas;

processing the sulphur dioxide containing gas to form sulphuric acid; and

re-cycling at least some of the formed sulphuric acid to the leaching stage.

4,376,654

AQUEOUS MULTIPHASE DISPERSIONS AND PREPARATION THEREOF

John C. Zola, 15460 Arrow Hwy., Baldwin Park, Calif. 91706

Continuation of Ser. No. 668,662, Mar. 22, 1976, abandoned. This application May 18, 1978, Ser. No. 906,995

Int. Cl.³ C08L 1/02

U.S. Cl. 106—163 R 28 Claims

1. The coating composition of the process of:

a. preparing at least one first flowable colored aqueous phase comprising a plurality of first colloid ions that have an aggregate charge that is either anionic or cationic;

b. preparing a second flowable aqueous phase of a color different from that of said first aqueous phase, said second aqueous phase comprising a plurality of second colloid ions that have an aggregate charge opposite to that of said aggregate charge of said first colloid ions, said first and second colloid ions when intermixed capable of reacting to define a body of hydrated anionic-cationic complex of fluid to gelatinous consistency that is of substantially less volume than the combined volume of said first and second phases;

c. intermixing said first and second phases to obtain said body of hydrated anionic-cationic complex that is disposed in a continuous aqueous phase, which continuous aqueous phase is what remains of said first and second phases after said anionic and cationic ions have reacted to form said hydrated anionic-cationic complex; and

d. subdividing said body of hydrated anionic-cationic complex into a plurality of discrete globules of such size that the major portion thereof are visible to the naked eye, with said globules being dispersed in said continuous phase.

4,376,655
PRODUCTION OF AN OPTICALLY EFFICIENT TITANIUM SLURRY

Leon Weber, Baltimore, Md., assignor to SCM Corporation, New York, N.Y.

Filed Feb. 17, 1982, Ser. No. 349,477
Int. Cl.³ C09C *1/36*
U.S. Cl. 106—300 **7 Claims**

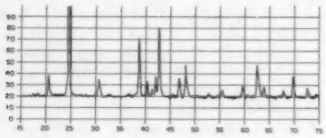
1. A process for producing an aqueous slurry of titanium dioxide which comprises:

blending particulate titanium dioxide, water, and amorphous aluminum hydroxide, and wherein the ratio of TiO_2 to aluminum hydroxide is between about 1000:1 and 2000:1.

4,376,656
HEAT RESISTANT YELLOW IRON OXIDE PIGMENT

Jihei Senda; Yoshihiro Inoue; Toshiaki Uenishi, all of Ube; Hidefumi Harada, Yamaguchi; Kouji Nakata, Ube; Akio Akagi, Ube, and Yakanori Yamasaki, Ube, all of Japan, assignors to Titan Kogyo K.K., Japan

Continuation-in-part of Ser. No. 154,270, May 29, 1980, abandoned. This application Oct. 16, 1981, Ser. No. 311,847
Claims priority, application Japan, May 30, 1979, 54-66102
Int. Cl.³ C01G *49/02*; C09C *1/24*
U.S. Cl. 106—309 **9 Claims**



1. A method of preparing a yellow iron oxide pigment having improved heat stability, comprising

(a) forming an aqueous slurry of from about 30 to about 200 parts of yellow iron oxide (α-FeOOH), from about 1 to about 100 parts of a soluble ferric salt selected from the group consisting of ferric sulfate, ferric chloride, ferric nitrate, ferric oxalate and ferric thiocyanate, an amount of an alkali metal hydroxide to provide the slurry with a pH of greater than 10, and from about 20 to about 100 parts of a water-soluble or alkali-soluble aluminum salt selected from the group consisting of sodium aluminate, potassium aluminate, aluminum chloride, and aluminum nitrate,

(b) adding to the above slurry from about 20 to about 100 parts as a third metallic component, a metal ion or ions having the characteristics of

(1) being capable of forming a solid solution with yellow iron oxide and

(2) having a valence of +3, or wherein a combination of ions is used having an average valence of +3, and

wherein the expression

$$2.5<\Sigma X_1 \cdot V_1<3.5$$

is satisfied, in which X_1=mole fraction of each metal ion added as the third component and V_1=valence thereof, the parts (a) and (b) being based on 1000 parts of water,

(c) subjecting the resultant mixture to hydrothermal treatment carried out at a temperature of from about 100° C. to about 240° C., for a time greater than 30 minutes, to form, on the surface of the iron oxide particle, a layer comprising (Fe Al)OOH and at least one other metal compound, in the form of a solid solution,

(d) separating the treated mixture into a solid phase and a liquid phase, and

(e) recovering the solid phase.

7. A method of preparing a yellow iron oxide pigment having improved heat stability, comprising

(a) forming a aqueous slurry of from about 30 to about 200 parts of yellow iron oxide (α-FeOOH), from about 1 to about 100 parts of a soluble ferric salt selected from the group consisting of ferric sulfate, ferric chloride, ferric nitrate, ferric oxalate and ferric thiocyanate, an amount of an alkali metal hydroxide to provide the slurry with a pH of greater than 10, and from about 20 to about 100 parts of a water-soluble or alkali-soluble aluminum salt selected from the group consisting of sodium aluminate, potassium aluminate, aluminum chloride, and aluminum nitrate,

(b) adding to the above slurry from about 20 to about 100 parts as a third metallic component, a metal ion or ions having the characteristics of

(1) being capable of forming a solid solution with yellow iron oxide and

(2) having a valence of +3, or wherein a combination of ions is used, having an average valence of +3, and wherein the expression

$$2.5<\Sigma X_1 \cdot V_1<3.5$$

is satisfied, in which X_1=mole fraction of each metal ion added as the third component and V_1=valence thereof, the parts of (a) and (b) being based on 1000 parts of water,

(c) subjecting the resultant mixture to a first hydrothermal treatment carried out at a temperature of from about 100° C. to about 240° C., for a time greater than 30 minutes, to form, on the surface of the iron oxide particle, a layer comprising (Fe Al)OOH and at least one other metal compound, in the form of a solid solution,

(d) separating the treated mixture into a solid phase and a liquid phase,

(e) forming an aqueous slurry of the solid phase,

(f) subjecting the slurry to a second hydrothermal treatment carried out a temperature of from about 250° C. to about 350° C., for a time period greater than 30 minutes, at a temperature higher than that of the first treatment,

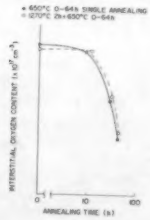
(g) separating the treated mixture into a second solid phase and a second liquid phase, and

(h) recovering the second solid phase.

4,376,657
METHOD OF MAKING FAULT-FREE SURFACE ZONE IN SEMICONDUCTOR DEVICES BY STEP-WISE HEAT TREATING

Kazutoshi Nagasawa, Odawara; Seigo Kishino, Hachioji; Yoshiaki Matsushita, and Masaru Kanamori, both of Tokyo, all of Japan, assignors to VLSI Technology Research Association, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,400
Claims priority, application Japan, Dec. 5, 1979, 54-157576
Int. Cl.³ H01L *21/322, 7/52, 21/263*
U.S. Cl. 148—1.5 **9 Claims**



1. In a method of manufacturing a semiconductor device, a method of forming in a semiconductor wafer denuded zones near the surfaces thereof without creating microdefects but creating in the interior of the semiconductor wafer microdefects capable of gettering, comprising the steps of:

heat treating said semiconductor wafer at a temperature in the range of 950° to 1,300° C. for more than 10 minutes but

preferably less than 70 hours in a non-oxidizing atmosphere, and

heat treating thereafter at a temperature in the range of 600° to 800° C. at least for one hour.

4,376,658

METHOD OF PRODUCING STRUCTURES COMPOSED OF PHOTOSENSITIVE RESIST FOR INTEGRATED SEMICONDUCTOR CIRCUITS

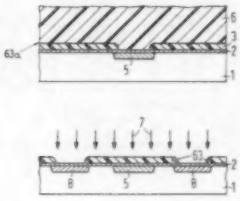
Reiner Sigusch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,538

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016050

Int. Cl.[3] **G03C** *5/00*; **C03C** *15/00, 27/06*

U.S. Cl. 148—1.5 **10 Claims**



1. In a method of producing structures composed of photosensitive resist layers on substrates provided for integrated semiconductor circuits wherein during the manufacture of such circuits, the production of structures functioning as masks occurs successively without the intervention of a high temperature process, the improvement consisting of the sequential steps of:

applying a photosensitive resist onto a substrate, generating a desired first mask structure therefrom and utilizing said mask to apply a select material onto said substrate;

applying a layer of a photosensitive resist onto the entire surface area of said substrate, including said mask structure;

said photosensitive resist utilized to generate said first mask structure and said photosensitive resist applied as a layer thereon containing similar solvent components so that at least a portion of said first mask structure disassociates into said layer or is removed by said solvent component; and

adjusting the thickness of said layer to a desired value, structuring said layer into a desired second mask structure and utilizing said second mask to apply a select material onto said substrate.

4,376,659

PROCESS FOR FORMING SEMICONDUCTOR ALLOYS HAVING A DESIRED BANDGAP

Carlos A. Castro, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 269,292, Jun. 1, 1981. This application Aug. 13, 1981, Ser. No. 292,755

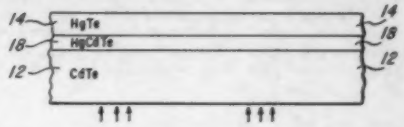
Int. Cl.[3] **H01L** *21/42, 21/423, 21/36*

U.S. Cl. 148—1.5 **20 Claims**

1. A process for forming a semiconductor alloy having a desired bandgap, comprising the steps of:

providing a semiconductor substrate comprising a first material, said first material having a bandgap wider than said desired bandgap and also being transparent to light at a wavelength corresponding to said desired bandgap;

depositing on said substrate a layer of a second material, said second material not being metallic and comprising a bandgap which is smaller than said desired bandgap; and



illuminating said substrate, from the surface of said substrate on which said layer of said second material was not deposited, with light having a wavelength which is at least as long as that corresponding to said desired bandgap.

4,376,660

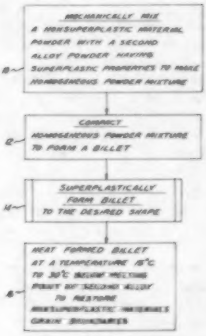
METHOD FOR INDUCING SUPERPLASTIC PROPERTIES IN NONSUPERPLASTIC METAL AND ALLOY POWDERS

Kamal E. Amin, Columbia, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 24, 1982, Ser. No. 361,279

Int. Cl.[3] **C22F** *1/00*

U.S. Cl. 148—11.5 P **27 Claims**


MECHANICALLY MIX A NONSUPERPLASTIC MATERIAL POWDER WITH A SECOND ALLOY POWDER HAVING SUPERPLASTIC PROPERTIES TO MAKE HOMOGENEOUS POWDER MIXTURE
8
COMPACT HOMOGENEOUS POWDER MIXTURE TO FORM A BILLET
12
SUPERPLASTICALLY FORM BILLET TO THE DESIRED SHAPE
14
HEAT FORMED BILLET AT A TEMPERATURE 15°C TO 30°C BELOW MELTING POINT OF SECOND ALLOY TO RESTORE
16
GRAIN BOUNDARIES

1. A method for superplastically forming nonsuperplastic metallic materials, comprising the steps of:

mixing, in powder form, a first quantity of a nonsuperplastic metallic material with a predetermined quantity of a second metal alloy having superplastic characteristics to form a homogeneous mixture;

compacting said homogeneous mixture to form a billet;

superplastically forming said billet to the desired shape; and

heating said formed billet in a temperature range from 15° C. to 30° C. below the melting point of said second alloy to restore the grain boundaries of said nonsuperplastic material.

4,376,661

METHOD OF PRODUCING DUAL PHASE STRUCTURE COLD ROLLED STEEL SHEET

Hiroshi Takechi, Kisaraza; Munetsugu Matsuo, Kawasaki, and Kazuo Koyama, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 48,587

Claims priority, application Japan, Jun. 16, 1978, 53-72802

Int. Cl.[3] **C21D** *8/04, 9/48*

U.S. Cl. 148—12 C **5 Claims**

1. A method of producing a dual phase structure cold rolled steel sheet having tensile strength 35 to 50 kg/mm^2, yield ratio

less than 60% and high elongation comprising steps of hot rolling and cold rolling by conventional process a steel containing 0.01 to 0.05% C, less than 0.2% Si, 1.7 to 2.5% Mn, 0.01 to 0.10% Al with the balance being Fe and unavoidable impurities, holding the produced steel sheet for 20 seconds to 20 minutes at a temperature 720° to 850° C., and cooling the steel sheet at a cooling rate between 3° and 30° C. per second and also above a value (°C. per second) shown by following formulae:

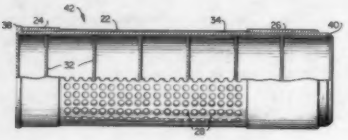
$$12\times[Mn(\%)]^2-62\times[Mn(\%)]+81.$$

4,376,662

METHODS FOR FABRICATING METALLIC WORKPIECES

Daniel J. Brimm, La Jolla, Calif., assignor to Chem-tronics, Inc., El Cajon, Calif.

Filed May 5, 1980, Ser. No. 146,396
Int. Cl.³ C21D 1/78
U.S. Cl. 148—12.3 **16 Claims**



1. A method of fabricating a tubular component of selected dimension and physical properties which comprises the steps of: providing a workpiece which has a cylindrical configuration and is fabricated of a precipitation hardening alloy that undergoes a volume change and a change in crystalline structure during hardening and which retains a large part of its strength at the temperature required for precipitation hardening; inserting into the workpiece thus formed a mandrel fabricated of a heat resistant alloy having a higher strength and higher coefficient of expansion than the material of which the workpiece is formed; and then precisely sizing said workpiece by heating the resulting assembly at a sufficiently high temperature and for a sufficiently long time to first expand the workpiece to the wanted final dimension by expansion of the mandrel and plastic flow of the workpiece material and to then dimensionally stabilize said workpiece at said final dimension by effecting a phase change in the material of which said workpiece is fabricated that hardens said workpiece material and thereby prevents further changes in the dimensions of said material.

4,376,663

METHOD FOR GROWING AN EPITAXIAL LAYER OF CDTE ON AN EPITAXIAL LAYER OF HGCDTE GROWN ON A CDTE SUBSTRATE

Cheng-Chi Wang, and Muren Chu, both of Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 207,863, Nov. 18, 1980, Pat. No. 4,357,620.
This application Dec. 8, 1981, Ser. No. 328,766
Int. Cl.³ H01L 21/208
U.S. Cl. 148—171 **3 Claims**

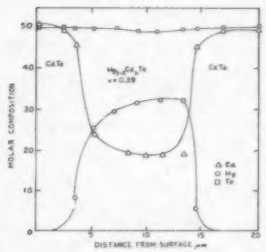
1. A liquid-phase-epitaxial method for growing a CdTe epitaxial layer on a HgCdTe epitaxial layer that has been grown on a CdTe substrate that has been mechanically and chemically polished, said method comprising:

(i) preparing a CdTe substrate with a predetermined oriented surface selected from the surfaces of (100), (110), (111)Cd, and (111)Te by lapping said substrate with a 3200 mesh abrasive, chemically polishing with a Br_2:HBr_2 solution of about 2% bromine by volume, cleaning in deionized water, trichloroethylene, acetone, and methanol in an ultrasonic cleaner, and finally by etching with a solution of about 5% by volume bromine in methanol to remove the polishing damage;

(ii) reacting in accordance with a first predetermined temperature profile an appropriate amount of high purity (99.9999%) Hg, Cd, and Te in a first melt composition, said first melt composition being CdTe:Hg:Te in ratio 0.004:0.251:0.745 which is contained in a first high pressure liquid-epitaxial-growth system apparatus comprising an inner quartz reaction tube and an outer quartz tube mounted in a vertical furnace that is controlled to within ±0.05° C., said outer quartz tube mounted between two stainless steel flanges to keep high argon gas pressure and to control the high mercury vapor pressure over said first melt composition containing said CdTe, Hg, and Te, said reacting in accordance with said first predetermined temperature profile including a heat-up time period of about 40 minutes from ambient temperature to a temperature of about 700° C. which is the reacting temperature of said first predetermined temperature profile that is maintained for a time period of about one hour;

(iii) reducing said reacting temperature of said first melt composition to about 550° C. which is the melt back temperature of said first predetermined temperature profile;

(iv) inserting said prepared CdTe substrate that is retained on a quartz sample holder into said first melt composition to allow said prepared CdTe substrate to melt back for about 15 seconds to eliminate a Hg vapor diffusion layer obtained during said heat-up time period and then reducing said temperature to the liquid-epitaxial-growth temperature which initially starts the growth time at a temperature within about 15° C. of the saturated or unsaturated temperature of said first melt composition, and said growth time taking place over a period of up to about 30 minutes;



(v) growing an epitaxial layer on said selected oriented surface of said substrate at a rate of about 1 micrometer per °C. as the growth temperature drops at a rate of from about 0.2 to about 1° C. per minute, said epitaxial layer being a layer of $Hg_{1-x}Cd_xTe$ on said selected oriented surface of said substrate of a predetermined thickness, with x being a value from about 0.17 to about 1.0 so that some mercury is always present in $Hg_{1-x}Cd_xTe$ layer, during said liquid-epitaxial-growth temperature period of said first predetermined temperature profile;

(vi) removing said inserted CdTe substrate retained on said quartz sample holder from said first melt composition and reducing the temperature at the completion of said liquid-epitaxial-growth temperature period to ambient temperature during a cool down period of said first predetermined temperature profile of from about 2 to about 3 hours;

(vii) positioning said substrate with said grown epitaxial layer of said $Hg_{1-x}Cd_xTe$ in a second high pressure liquid-epitaxial-growth system apparatus which is loaded with a predetermined amount of a high purity (99.9999%) materials of Sn, Hg, and CdTe in a ratio of Sn:Hg:CdTe which equals 36:5:0.15, said materials forming a growth

solution when molten for the growth of an epitaxial layer of CdTe on said epitaxial layer of said $Hg_{1-x}Cd_xTe$;

(viii) reacting in accordance with a second predetermined temperature profile said materials of Sn:Hg:CdTe to form a second melt composition which is contained in a said second high pressure liquid-epitaxial-growth system apparatus of a like set-up defined for said first high pressure liquid-epitaxial-growth system apparatus, said reacting in accordance with said second predetermined temperature profile including a heat-up time period of about 40 minutes from ambient temperature to a temperature of about 700° C. which is the reacting temperature of said second predetermined temperature profile that is maintained for a time period of about one hour;

(ix) reducing said reacting temperature of said second melt composition from about 700° C. to about 525° C. which is the starting temperature for CdTe epitaxial layer growth;

(x) inserting said substrate with said grown epitaxial layer of said $Hg_{1-x}Cd_xTe$ into said second melt composition and supercooling said second melt composition at a rate from about 1° C. to about 5° C. per minute which is necessary to avoid melting said epitaxial layer of said $Hg_{1-x}Cd_xTe$ during the epitaxial growing of a CdTe layer on said $Hg_{1-x}Cd_xTe$;

(xi) growing an epitaxial layer of CdTe on said $Hg_{1-x}Cd_xTe$ layer as the growth temperature drops during said supercooling at said rate from about 1° C. to about 5° C. per minute to complete a supercooling temperature range greater than 15° C. and an epitaxial layer of CdTe of a few micrometers thickness; and

(xii) removing said inserted substrate with said grown epitaxial layers of $Hg_{1-x}Cd_xTe$ and CdTe thereon from said second melt composition and reducing the temperature at the completion of said liquid-epitaxial-growth temperature period to ambient temperature during a cool . own period of said predetermined temperature profile of from about 2 to about 3 hours.

4,376,664

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

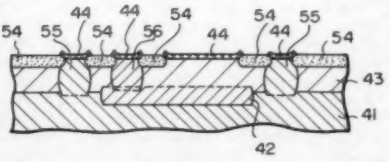
Osamu Hataishi, Yokohama, and Yoshinobu Momma, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed May 30, 1980, Ser. No. 155,124

Claims priority, application Japan, May 31, 1979, 54-67612; May 31, 1979, 54-67614

Int. Cl.³ H01L *21/20, 21/26*

U.S. Cl. 148—175 **9 Claims**



1. A method of producing a semiconductor device comprising at least one bipolar transistor and an isolation region which are formed in an epitaxial layer formed on a semiconductor substrate having a buried layer, said method comprising, in sequence, the steps of:

(A) forming a layer capable of masking against oxidation on said epitaxial layer,

(B) forming an insulating layer on said anti-oxidation masking layer,

(C) forming a patterned negative resist layer on said insulating layer,

(D) selectively etching said insulating layer by using said negative resist layer as a mask,

(E) introducing a first impurity into a first predetermined portion of said epitaxial layer corresponding to the isolation region by using a first patterned positive resist layer as a mask,

(F) introducing a second impurity through said masking layer into a second predetermined portion of said epitaxial layer corresponding to a collector-connecting-region of the bipolar transistor by using a second patterned positive resist layer as a mask,

(G) removing said positive resist mask,

(H) forming a metal layer over the whole exposed surface,

(I) removing said patterned negative resist layer and the portion of said metal layer thereon,

(J) etching the remaining portion of the insulating layer and the portion of said anti-oxidation layer lying thereunder by using the remaining layer as a mask,

(K) removing said remaining metal layer,

(L) selectively thermal-oxidizing said epitaxial layer by using the remaining anti-oxidation masking layer as a pattern mask to form a thick oxide layer, while at the same time diffusing said introduced first and second impurities into said epitaxial layer to form said isolation region and said collector region in contact with said buried layer, respectively, and

(M) forming a base region and an emitter region of the bipolar transistor in a portion of said epitaxial layer above said buried layer.

4,376,665

EXPLOSIVE COMPOSITION COMPRISING PENTABORANE AND TRIS (DIFLUORAMINO) FLUOROMETHANE

Alphonso W. Marcellis, Boonton, and Chester J. Grelecki, Denville, both of N.J., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 26, 1964, Ser. No. 347,631

Int. Cl.² C06B *47/10*

U.S. Cl. 149—22 **4 Claims**

1. A novel composition of matter comprising a mixture of pentaborane and tris(difluoramino)fluoromethane.

4,376,666

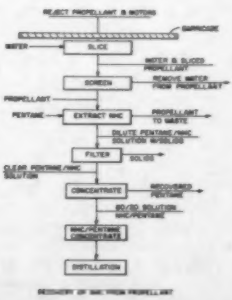
PROCESS FOR THE RECOVERY OF CARBORANE FROM REJECT PROPELLANT

Leroy J. Williams, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1980, Ser. No. 194,192

Int. Cl.³ D03D *23/00*

U.S. Cl. 149—109.6 **4 Claims**



1. A process for the recovery of n-hexylcarborane from reject propellant comprising:

(i) providing a quantity of reject propellant containing n-hexylcarborane to be recovered;
(ii) adding said reject propellant to an extraction vat provided with a removable propellant screen bucket, a removable cover for said extraction vat, agitator means for mixing said reject propellant with an extraction solvent, a means for filling and draining said extraction solvent, a means for venting said extraction vat, and a means for purging said extraction vat with an inert gas, said means for venting being in fluid communication with a condenser for said extraction solvent;
(iii) securing said removable cover and opening said venting means to said condenser means to prevent loss of said extraction solvent during the filling of said extraction vat with said extraction solvent;
(iv) filling said extraction vat with an extraction solvent selected from pentane and hexane, said extraction solvent being in excess of said quantity of reject propellant provided;
(v) agitating said reject propellant and said extraction solvent to form a slurry mixture of said reject propellant and said extraction solvent;
(vi) allowing said reject propellant to soak for a predetermined time period of up to about 27 hours to extract said n-hexylcarborane from said reject propellant;
(vii) opening said vat and raising said screen bucket containing said extracted reject propellant above said vat to allow said n-hexylcarborane/extraction solvent solution to drain into said vat;
(viii) transferring said extracted reject propellant to disposal;
(ix) pumping said n-hexylcarborane/extraction solvent solution from said extraction vat through a filter to remove any small suspended particles of propellant and other solids;
(x) admitting said n-hexylcarborane/extraction solvent solution from filter to a partially water filled wash tank, said n-hexylcarborane/extraction solvent solution admitted at the bottom of said tank through a dip tube;
(xi) allowing said n-hexylcarborane/extraction solvent solution to diffuse up through the water in said wash tank to remove ammonium perchlorate and other water soluble materials and to permit separation of said n-hexylcarborane/extraction solvent solution into a layer on top of the water layer;
(xii) siphoning said n-hexylcarborane/extraction solvent solution from the water layer and discharging the water to waste disposal;
(xiii) passing said n-hexylcarborane/extraction solvent solution that is siphoned from the water layer through a filter dryer to remove any possible solid material and to dry the solution prior to transferring to a still;
(xiv) transferring said n-hexylcarborane/extraction solvent solution to a still and concentrating the n-hexylcarborane by flash distilling about 80% of the extraction solvent from said n-hexylcarborane/extraction solvent solution;
(xv) condensing the extraction solvent and then returning said extraction solvent to an extraction solvent storage for reuse; and,
(xvi) transferring the 80/20 n-hexylcarborane/extraction solvent solution to an n-hexylcarborane production facility for purification by distilling from an n-hexylcarborane purification still.

4,376,667

METHOD OF INCREASING THE WEAR RESISTANCE OF AN ELASTOMERIC BODY

Otto Beckmann, Traiskirchen, Austria, assignor to Semperit Aktiengellschaft, Vienna, Austria

Filed Jul. 19, 1978, Ser. No. 926,222
Claims priority, application Switzerland, Aug. 4, 1977, 9576/77
Int. Cl.³ B05D *3/02, 7/02;* **B29C** *25/00;* **B32B** *31/26*
U.S. Cl. 156—83 **25 Claims**

1. A method of increasing the wear resistance of a vulcanized elastomeric body having a surface region exposed to load containing at least one reinforcement element, for instance, a tire, V-belt, conveyor belt, hose, resilient element, floor covering or the like, by changing its stress state, comprising the steps of:

providing an elastomeric body with at least one reinforcement element;

treating only the surface region exposed to load of the elastomeric body by impregnating said elastomeric body with a swelling agent comprising a medium which is soluble in the elastomer of the elastomeric body in an amount effective for swelling said treated portion,

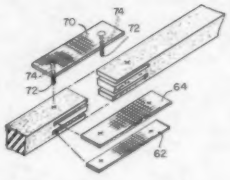
the distribution of the swelling agent diminishing from the region of said treated region of the elastomeric body towards the reinforcement element.

4,376,668

APPARATUS FOR AND METHOD OF MAKING V-BELTS

Tom Ginter, Jr., Box 193, Clearfield, Ky. 40313, and Harold E. Hunt, General Delivery, Meta, Ky. 41501

Filed Dec. 7, 1981, Ser. No. 328,338
Int. Cl.³ B29C *27/06;* **B32B** *7/08;* **B65H** *69/06*
U.S. Cl. 156—92 **16 Claims**



1. An apparatus for making V-belts comprising a base member, a cover for said base member, said cover being mounted on said apparatus for movement selectively into closing or opening relation to said base member, a guide means carried by said base member for receiving a length of belting from a supply, first means cooperating with said guide means for receiving and guiding cutting means to cut a predetermined length of said belting required for forming a closed loop of said belting, second means cooperating with said guide means for receiving and guiding a cutting means in making a slot in each free end of said belting for receiving a weblike splice element adapted to bridge the free ends of said predetermined length of belting to form said loop, and heating means carried by said apparatus for vulcanizing the free ends of said predetermined length to form a splice between said free ends.

12. The method of making a V-belt loop from a length of V-belting which comprises the steps of:

(1) measuring a predetermined required length of V-belting from a supply of V-belting, said belting including a substantial content of rubber-like material;
(2) cutting the V-belting to separate the required predetermined length of belting from the supply of V-belting;
(3) making a slot in each free end of said predetermined length of belting, each of said slots extending inwardly of said predetermined length in a lengthwise direction from the corresponding free end of said predetermined length, whereby to provide a slot in each of said free ends;
(4) positioning a web-like splice element in the oppositely-disposed slots of the two ends of said predetermined length of belting, with said two free ends being in substantially abutting relation to each other and with said splice element being in bridging relation to said ends of said belting; and
(5) vulcanizing the region of said belting comprising said abutting ends and said splice element, whereby to provide a strong and secure spliced joint between said two ends of said predetermined length.

4,376,669

METHOD OF FABRICATING ENERGY ABSORBING STRUCTURE

Friedrich C. Math, Farnham, England, assignor to The British Petroleum Company Limited, London, England

Filed Aug. 12, 1981, Ser. No. 292,210
Claims priority, application United Kingdom, Aug. 15, 1980, 8026639
Int. Cl.³ B65H 81/00; B32B 1/00
U.S. Cl. 156—161 10 Claims

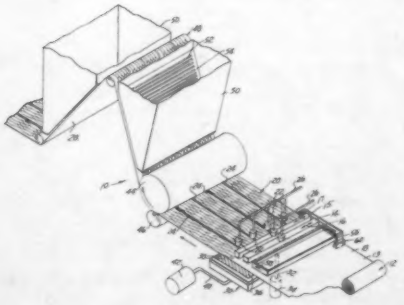
1. A method of fabricating an energy absorbing structure comprising the steps of (a) winding a continuous resin wetted filament one or more times around an attachment point at one end of a jig to a further attachment point at the opposite end of the jig so as to form a longitudinal strand of pre-determined diameter, (b) passing the filament around and adjacent attachment point and repeating the winding sequence for further pairs of attachment points at opposite ends of the jig so as to build up an array of parallel strands, (c) displacing and tensioning the parallel strands by means of first cross bars substantially at right angles to the strands, (d) winding a second array of parallel strands between the attachment points at opposite ends of the jig over said first cross bars, (e) displacing said second array onto said first array by means of second cross bars lying parallel and inbetween the first cross bars, (f) laying a third array of parallel strands between the attachment points at opposite ends of the jig over said first and second cross bars and (g) curing the structure.

4,376,670

METHOD FOR COATING PAPER WITH A PLASTIC PATTERN

John Rodish, Ft. Wright, Ky., assignor to Polynovus Industries, Inc., Ft. Wright, Ky.

Continuation of Ser. No. 88,862, Oct. 29, 1979, abandoned. This application Feb. 19, 1981, Ser. No. 235,929
Int. Cl.³ B29D 7/02
U.S. Cl. 156—244.21 9 Claims



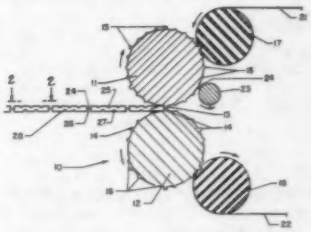
1. A method of reinforcing a relatively thin and porous substrate comprising linearly translating said substrate at a substantially constant velocity under a plurality of applicator nozzles, extruding a plastic material through said nozzles, oscillating said nozzles at a predetermined frequency in a reciprocating motion at right angle to the direction of translation of said substrate for applying on a surface of said substrate relatively narrow stripes of extruded plastic material in a closed mesh pattern, applying suction to the other surface of said substrate, air cooling said plastic material, monitoring breakage of said substrate, and placing a catch pan under said nozzles upon detection of a break in said substrate.

4,376,671

MULTI-PLY FIBROUS WEB STRUCTURE AND ITS MANUFACTURE

Galyn A. Schalz, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 149,913, May 15, 1980, Pat. No. 4,320,162. This application Oct. 5, 1981, Ser. No. 308,948
Int. Cl.³ B32B 31/06, 31/08; D21H 5/06
U.S. Cl. 156—549 6 Claims



1. Apparatus for fabricating multi-ply embossed web structure, comprising: first and second embossing rolls, each having a pattern of mutually, relatively widely spaced first identical protuberances and a pattern of mutually, relatively closely spaced second identical protuberances in the spaces between said first protuberances, said rolls being constructed and arranged so that said closely spaced protuberances on one roll mesh with the like protuberances on the other roll and to form a ply bonding nip between confronting ones of said first protuberances only; backup rolls for said embossing rolls cooperative therewith to form corresponding embossments in each of a pair of fibrous webs fed therebetween; means for applying adhesive solely to the distal ends of embossments formed in at least one of said webs by said relatively widely spaced first protuberances; and means for adhesively joining to the opposite one of said webs the distal ends of embossments formed in said webs by said relatively widely spaced first protuberances.

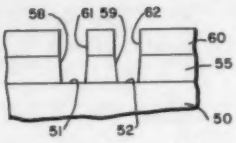
3. Apparatus for fabricating multi-ply embossed web structure, comprising: first and second embossing rolls, each having a pattern of mutually, relatively widely spaced first identical protuberances of a first radial extent and a pattern of mutually, relatively closely spaced second identical protuberances of a second radial extent less than the recited first protuberances in the spaces between said first protuberances, said rolls being constructed and arranged to form a ply bonding nip between confronting ones of said aligned first identical protuberances only; backup rolls for said embossing rolls cooperative therewith to form corresponding embossments in each of a pair of fibrous webs fed therebetween; means for applying adhesive to the distal ends of embossments formed in each of said webs by said first identical protuberances, prior to entry of said webs into said ply bonding nip; and means for feeding a creped fibrous web into the ply bonding nip adhesively to join said pair of embossed webs solely at through said distal ends of said embossments formed by said first protuberances.

4,376,672

MATERIALS AND METHODS FOR PLASMA ETCHING OF OXIDES AND NITRIDES OF SILICON

David N. Wang, Cupertino; Frank D. Egitto, Santa Clara, and Dan Maydan, Los Altos, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Oct. 26, 1981, Ser. No. 315,133
Int. Cl.[3] B44C 1/22; C03C 15/00, 25/06; H01L 21/306
U.S. Cl. 156—643 12 Claims



1. In a method for etching a layer of inorganic insulating material formed on a semiconductor wafer and containing silicon as the principal metallic element, the steps of:

disposing said wafer on one of a pair of electrode structures in a closed chamber;

communicating into said chamber a reactive gas mixture comprising principally a fluorocarbon gas doped with a preselected quantity of carbon dioxide; and

supplying radio frequency electrical energy to one of said electrode structures to create a plasma of said reactive gas mixture for chemically attacking said insulating material.

4,376,673

METHOD FOR ETCHING DENTAL PORCELAIN

Peter P. L. Cheung, Gulph Mills, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 19, 1981, Ser. No. 235,809
Int. Cl.[3] B44C 1/22; A61C 13/00
U.S. Cl. 156—662 11 Claims

1. A method of repairing a porcelain dental device, in situ, comprising:

cleaning the portion of porcelain to be repaired;

contacting said porcelain with a buffered solution containing trace amounts of hydrogen fluoride for at least two minutes to etch said porcelain; and

removing said solution and bonding a repair material to said etched portion of said porcelain.

4,376,674

METHOD OF MANUFACTURING FLAME AND ABUSE RESISTANT FIBER PANEL AND PRODUCTS RESULTING

Mohammad H. Ali, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,935
Int. Cl.[3] D21J 5/08
U.S. Cl. 162—136 10 Claims

1. A process of manufacturing a flame resistant and water resistant surface on a fiberboard panel comprising:

forming a water-laid mat of multiple layers of fiber, to have a moisture content between about 40–70% by weight of water;

coating a surface of the wet mat with an aqueous slurry of about 20–60% by weight calcium carbonate and about 80–40% by weight sodium silicate solution; said silicate solution having a weight ratio of SiO_2/Na_2O_3 ranging between about 2.5 and 3.3, having an alkali silicate solids weight content between about 30% and 55%, and having a viscosity between about 50 and 500 centipoises at 70° F.; and

drying the coated mat at a temperature between about 300° and about 450° F.

10. A fiberboard product having a flame and water resistant surface comprising a wood fiber insulation board mat having coated on at least one surface thereof the dry solids from the application of an aqueous slurry containing by weight about 20–60% calcium carbonate solids and about 10–40% sodium silicate solids having a SiO_2/Na_2O_3 weight ratio of between about 2.5 and 3.3 to the board mat when the mat contains about 40–70 weight % moisture and dried at a temperature between about 300° and about 450° F.

4,376,675

METHOD OF MANUFACTURING AN INORGANIC FIBER FILTER TUBE AND PRODUCT

Kenneth A. Perrotta, Methuen, Mass., assignor to Whatman Reeve Angel Limited, Kent, England

Continuation of Ser. No. 42,124, May 24, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 193,924
Int. Cl.[3] D21D 3/00; D21H 1/08
U.S. Cl. 162—145 19 Claims

1. A method of preparing a nonwoven, fibrous, self-supporting, semirigid, all-inorganic, silicate-bound, filter tube consisting essentially of a plurality of interrelated, nonwoven fibers having interstices therebetween, the fibers bonded at the crossover points of the fibers with a bonding agent, which method comprises:

(a) preparing an aqueous slurry comprising an admixture of low-melting-point, glass-binder fibers and high-melting-point, inorganic, filter fibers, the difference in melting point being greater than 100° F., the glass-binder fibers being present in an amount sufficient to act as a bonding agent for the inorganic filter fibers, the inorganic fibers being present in an amount sufficient to provide for a formed, porous, filter tube;

(b) forming the fibers from the slurry into a nonwoven filter tube comprising a wet mass of the fibers;

(c) heating the filter tube so formed to dry the filter tube;

(d) heating the dried filter tube for a timed period and to a temperature greater than the melting point of the low-melting-point, glass-binder fibers and less than the melting point of the high-melting-point, inorganic filter fibers, to melt substantially all of the low-melting-point, glass-binder fibers and to have the low-melting-point molten material move to the crossover points of the inorganic filter fibers, the heating carried out, without any substantial softening of the inorganic filter fibers; and

(e) cooling and recovering the porous filter tube of inorganic fibers, wherein the glass of the glass fibers forms the bonding agent for the inorganic filter tube.

17. The filter tube prepared by the method of claim 1.

4,376,676

IN-LINE SEPARATOR FOR CRUDE OIL

Carl L. Gill, 62 Coronado Dr., Kenner, La. 70062

Filed Oct. 19, 1981, Ser. No. 312,863
Int. Cl.[3] B01D 19/00; C10G 31/10, 33/06
U.S. Cl. 196—46 9 Claims

1. A device for the continuous separation of crude oil into its major constituent phases comprising

(a) a cylindrical outer envelope having an upstream upper extremity provided with a port for the inlet of a fluid stream, and a downstream lower extremity provided with ports for the egress of fluid streams,

(b) a cylindrical interior chamber concentrically disposed within said outer envelope so as to form therewith an outer annular space, said interior chamber being closed at its upper extremity and provided adjacent its lower extremity with inlet and outlet means permitting passage of fluid streams,

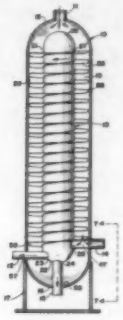
(c) a spiralled vane positioned within said outer annular space,

(d) block-off means associated with the lowermost extremity of said vane adapted to route fluid adjacent said outer envelope out of said device via one of said ports for egress, and to

route more centrally located fluids into said interior chamber via said inlet means,

(e) a cylindrical tube coaxially centered within said interior chamber and defining therewith an inner annular space,

(f) a series of contact discs in spaced apart relationship within said inner annular space, said discs having openings to permit passage of fluid streams, and



(g) separating means disposed within said interior chamber adjacent the lower extremity thereof which causes gas to emerge from the oil phase and travel upwardly through said inner annular space, whereby

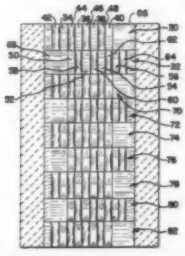
(h) a stream of crude oil entering the device is divided into streams comprised of substantially gas, oil and water which separately emerge from said outer envelope.

4,376,677

COKE OVEN HEATING WALL

Donald J. Gerber, Glenshaw, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,126
Int. Cl.³ C10B *5/02, 29/02*
U.S. Cl. 202—267 A **10 Claims**



1. In a heating wall interposed between two adjacent coking oven chambers in a horizontal coke oven battery comprising a pair of spaced longitudinal liner walls each of said walls having a flue adjacent surface and an oven adjacent surface and intermediate transverse tie walls tying said liner walls and defining therewith individual vertical combustion flues inside the heating wall, wherein the improvement comprises:

(a) a first row of vertically disposed ridges depending from the flue adjacent surface of at least one liner wall, and being arranged such that said ridges are laterally aligned and spaced from one another to define recessed spaces therebetween; and

(b) a second row of vertically disposed ridges depending from said flue adjacent surface of said liner wall and said ridges being laterally aligned above said first row and spaced from one another to define recessed spaces therebetween, and wherein the ridges of said second row are vertically aligned with the recessed spaces of the first row such that surface turbulence is established in rising gases in the flue.

4,376,678

METHOD OF INHIBITING POLYMERIZATION OF VINYL AROMATIC COMPOUNDS

Richard D. Partos, Lunenberg, Mass., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jul. 29, 1982, Ser. No. 403,192
Int. Cl.³ B01D *3/32;* **C07C** *7/05, 7/20*
U.S. Cl. 203—9 **5 Claims**

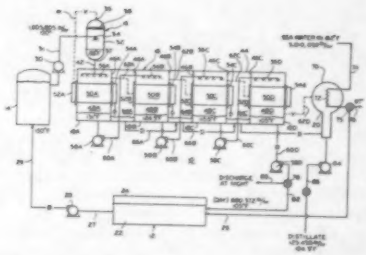
1. A method of distilling a readily polymerizable vinyl aromatic compound, which comprises subjecting said compound to a vacuum distillation condition in a distillation system in the presence of 2,2-bis(3,5-dinitro-4-hydroxy-phenyl) propane.

4,376,679

SOLAR DESALTING PROCESS

Philip J. Liu, Germantown, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 172,089, Jul. 25, 1980, Pat. No. 4,330,373.
This application Sep. 28, 1981, Ser. No. 306,211
Int. Cl.³ B01D *3/06*
U.S. Cl. 203—71 **3 Claims**



1. A method of distilling an impure liquid comprising the steps of:

passing the liquid through an energy input means consisting of a solar collector at a first rate during daylight hours for elevating the temperature thereof,

storing said heated liquid in a storage tank having a capacity greater than that of the solar collector, passing said stored liquid at a second rate which is lower than said first rate to a flash evaporator,

flash evaporating a part of said liquid in said flash evaporator at a temperature which is lower than that of said stored liquid and collecting the unevaporated part,

providing a multi-evaporator, maintaining the effects of said multi-effect evaporator at successively lower temperatures, each effect of said multi-effect evaporator having heat exchange tubes,

passing the vaporized part of said liquid from said flash evaporator to one surface of the heat exchange tubes of the first effect of said multi-effect evaporator and delivering the unevaporated part of the liquid to the other surface of said heat exchange tubes for condensing said vapor whereby a further part of the unevaporated liquid evaporates,

successively passing the vapor generated in each effect and the unevaporated liquid to the heat exchange tubes of the next lower temperature effect,

collecting the condensate from the effects and condensing

the vapor from said lowest temperature effect as the products of the system,

recirculating at least a portion of the unevaporated feed liquid of said multi-effect evaporator to said solar collector during daylight hours, and

discharging said unevaporated feed liquid during nighttime hours.

2. A method of distilling an impure liquid comprising the steps of:

heating the liquid in a solar collector during daylight hours for elevating the temperature thereof;

providing a storage container,

transferring said heated liquid to said storage container,

passing said stored liquid to a flash evaporator,

providing a flash evaporator,

flash evaporating a part of said liquid in said flash evaporator and collecting the unevaporated part,

providing a multi-effect film evaporator,

maintaining the effects of said multi-effect film evaporator at successively lower temperatures,

passing the vaporized part of said liquid from said flash evaporator to the first effect of said multi-effect film evaporator as the vapor input thereof and delivering the unevaporated part of the liquid to the first effect as the feed liquid thereof for condensing said vapor whereby a further part of the unevaporated liquid evaporates,

successively passing the vapor generated in each effect and the unevaporated liquid to the next lower temperature effect, and

collecting the condensate from the effects and condensing the vapor from said lower temperature effect as the product of the systems,

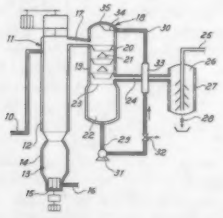
recirculating at least a portion of the unevaporated feed liquid of said multi-effect evaporator to said solar collector during daylight hours, and

discharging said unevaporated feed liquid during nighttime hours.

4,376,680
PROCESS FOR DEMONOMERIZING POLYCAPRONAMIDE

Edgardo Horak, Saronno; Alvaro Casati, Paderno Dugnano; Giancarlo Bianucci, Milan; Luigi Marafioti, Milan, and Silvio Notarbartolo, Milan, all of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed Dec. 10, 1979, Ser. No. 100,907
Claims priority, application Italy, Dec. 6, 1978, 30610 A/78
Int. Cl.³ B01D *1/22, 3/12*
U.S. Cl. 203—89 **10 Claims**



1. Method for the demonomerization of polycapronamide containing caprolactam monomer, which comprises:

(a) providing a thin layer evaporator for evaporating the caprolactam monomer from the polymer,

means for conveying to said evaporator the polycapronamide to be demonomerized,

a condenser,

means for creating a vacuum in the evaporator through the condenser and for conveying to the condenser the evaporated caprolactam vapor,

the condenser being provided with means for contacting said caprolactam vapor with molten caprolactam whereby said molten caprolactam can absorb said vapor caprolactam and means for determining the desired path and the desired subdivision of the molten and vapor caprolactam,

an external molten caprolactam circulation circuit which feeds the condenser and is fed thereby,

means for drawing off from said circuit a stream of caprolactam corresponding to the amount of vapors which are absorbed,

and means on said circuit for replacing a portion of said stream containing said absorbed vapors with fresh, pure caprolactam,

(b) introducing into said thin layer evaporator said polycapronamide containing caprolactam monomer, and

(c) removing demonomerized caprolactam from said means for drawing off caprolactam.

4,376,681
METHOD OF MEASURING CARBON DIOXIDE IN A LIQUID OR GAS

Tomoaki Inoue, Machida; Yoichi Ishikawa, and Mitsunori Kaneko, both of Tokyo, all of Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1980, Ser. No. 170,919
Claims priority, application Japan, Jan. 8, 1979, 54-1082
Int. Cl.³ G01N *27/56;* A61L *2/06*
U.S. Cl. 204—1 T **1 Claim**

1. A method of measuring carbon dioxide concentration in liquid or gas, comprising the steps of: inserting a membrane into a lower cap and mounting said lower cap on an outer tube to close a lower end of said outer tube with said lower cap; inserting a membrane protecting rod into said outer tube and securing said rod to said outer tube with an upper cap; placing said outer tube in a hole in a cover or sidewall of a vessel containing the material to be tested; sterilizing said outer tube with steam and then cooling the same; pulling out only said membrane protecting rod; introducing electrolyte into said outer tube; inserting a pH glass electrode into said outer tube; connecting said pH glass electrode to an indicator; and detecting a change in pH of said electrolyte which occurs when carbon dioxide gas in said vessel permeates said membrane and is dissolved into said electrolyte wherein the carbon dioxide is formed into carbonic acid.

4,376,682

METHOD FOR PRODUCING SMOOTH COHERENT METAL CHALCONIDE FILMS

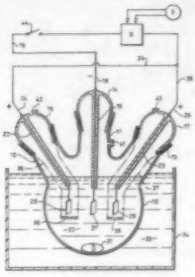
William R. Fawcett, and Andrzej S. Baranski, both of Guelph, Canada, assignors to TDC Technology Development Corporation, Vancouver, Canada

Continuation of Ser. No. 137,721, Apr. 7, 1980. This application Dec. 4, 1980, Ser. No. 212,863

The portion of the term of this patent subsequent to Mar. 11, 1997, has been disclaimed.

Int. Cl.³ C25D 3/02, 9/08

U.S. Cl. 204—14 N 35 Claims



1. A method for producing a smooth coherent mixed metallic chalconide film of which the metal moiety is a metal selected from the group consisting of Cd, Pb, Hg, Cu, Bi, Co, Ni, Tl, Ag, In, Fe, and mixtures thereof and the chalconide moiety is a chalcogen selected from the group consisting of S, Se, Te and mixtures thereof, at least one of said metal and said chalcogen comprising a mixture, comprising the steps of providing an electrolytic bath comprising an organic polar solvent having dissolved therein (a) said metal in the form of a salt that is ionised and is electrically conductive in solution in said solvent and (b) said chalcogen in elemental form; maintaining the bath at elevated temperature above about 80° C.; subjecting the bath to electrolysis at a current density that is sufficiently low with respect to the surface area of the cathode that a smooth coherent film of said mixed chalconide is deposited on the cathode; and continuing the electrolysis until a desired thickness of film has built up on the cathode.

4,376,683

METHOD AND DEVICE FOR THE PARTIAL GALVANIZATION OF SURFACES WHICH ARE CONDUCTING OR HAVE BEEN MADE CONDUCTING

Hubertus Hellwig, Munich; Hans-Joachim Schuster, and Klaus-Dieter Heppner, both of Berlin, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 249,028

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015282

Int. Cl.³ C25D 5/02, 17/00

U.S. Cl. 204—15 10 Claims

1. A method for the partial galvanization of a surface of a conductive material, comprising the steps of:

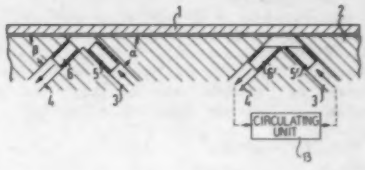
supplying an electrolyte solution for use in depositing a metal or its alloy on the surface to be galvanized;

providing a flow-on channel for supplying the electrolyte solution and a flow-off channel positioned at an angle relative to the surface to be treated of less than 45°;

positioning the two channels to direct the electrolyte solution onto the surface to be treated such that a substantially laminar flow arises across the surface from the flow-on channel to the flow-off channel;

providing the flow-on and flow-off channels of a corrosion-resistant material; and

arranging a metallic anode element in each of the flow-on



and flow-off channels directly adjacent to the area of which the surface to be treated is to be located, and providing the anode elements with a tunnel-like shape through which the electrolyte solution may flow.

4,376,684

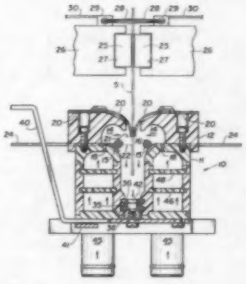
SHIELDED PLATING CELL AND METHOD

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Filed Aug. 24, 1981, Ser. No. 295,714

Int. Cl.³ C25D 5/02, 5/08

U.S. Cl. 204—15 5 Claims



1. A shielded plating cell comprising, in combination,

a flow guide,

a sparger assembly positioned beneath the flow guide,

means defining a reverse flow chamber at a lower portion of the flow guide and adjacent the sparger,

discharge means in the sparger for processing fluid into the reverse flow chamber to impinge upon a printed circuit board,

shields in the form of a flexible sheet-like member having a lower edge depending from the upper portion of the flow guide and in tangential pressure relationship with the printed circuit board,

means above and remote from the chamber for horizontal transport parallel to the lower edge of the shields,

and a manipulable choke assembly beneath the shields and contained printed circuit board whereby the discharge of spent fluid may be controlled and the venturi effect of the reverse flow chamber balanced to avoid the pumping of fluid up the shield or at the delta defined by the shield in the ends of the printed circuit board.

4,376,685
ACID COPPER ELECTROPLATING BATHS CONTAINING BRIGHTENING AND LEVELING ADDITIVES

Angus Watson, Bricktown, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jun. 24, 1981, Ser. No. 277,057
Int. Cl.[3] C25D 3/38
U.S. Cl. 204—52 R 45 Claims

1. An aqueous acid copper electroplating bath containing an alkylated polyalkyleneimine obtained as the reaction product of a polyalkyleneimine represented by the formula:

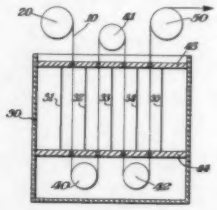
$$H_2N-(CH_2)_nNH-R$$

wherein R is H or $(CH_2)_n NH_2$ and n=1 to 6, with an epihalohydrin and an alkylating agent.

4,376,686
AC ETCHING OF ALUMINUM CAPACITOR FOIL

Mulk R. Arora, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 16, 1981, Ser. No. 321,973
Int. Cl.[3] C25F 3/04
U.S. Cl. 204—129.85 4 Claims



1. A process for the etching of aluminum capacitor foil comprising passing the foil through an electrolytic bath under the influence of alternating current, said bath consisting essentially of 0.8 to 1.5 moles/liter of hydrochloric acid, 0.4 to 0.5 moles/liter aluminum chloride, 0.04 to 0.3 moles/liter of nitric acid, and 0.05 to 0.2 moles/liter of tartaric acid, said alternating current having a frequency of 12 to 20 Hz, at a temperature of about 30° to 40° C. rendering said foil more amenable to subsequent processing.

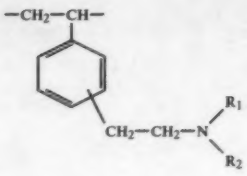
4,376,687
NITROGEN-CONTAINING ACRYLIC COPOLYMER COMPOSITION

Tetsuya Miyake, Tokyo; Kunihiko Takeda, and Akihiko Ikeda, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 13, 1980, Ser. No. 206,587
Claims priority, application Japan, Dec. 28, 1979, 54/170305; Aug. 5, 1980, 55/111832
Int. Cl.[3] C08L 63/00; C25D 13/06
U.S. Cl. 204—181 C 44 Claims

1. A nitrogen-containing acrylic copolymer composition comprising:

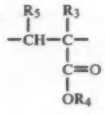
(i) a linear copolymer comprising about 2 to about 90% by weight of recurring units of Formula (A),


(A)

wherein

R_1 and R_2, which may be the same or different, each represents a hydrogen atom, a C_{1-20} alkyl group, a C_{3-10} cycloalkyl group, a C_{3-8} alkenyl group, a C_{1-15} aminoalkyl group, a C_{6-20} aryl group or a C_{7-12} arylalkyl group,

based on the total weight of the linear copolymer, about 10 to about 98% by weight of recurring units of Formula (B),


(B)

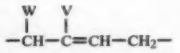
wherein

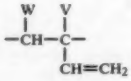
R_3 represents a hydrogen atom, a methyl group, a C_{1-6} alkoxy group, a halogen atom or a $—CH_2COOR_6$ group wherein R_6 represents a hydrogen atom, a C_{1-10} alkyl group or a C_{7-12} arylalkyl group,

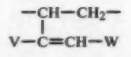
R_4 represents a hydrogen atom, a C_{1-20} alkyl group, a C_{3-10} cycloalkyl group, a C_{3-10} halocycloalkyl group, a C_{6-20} aryl group, a C_{6-20} haloaryl group, a C_{7-12} arylalkyl group, a C_{1-12} haloalkyl group, a C_{1-12} hydroxyalkyl group, a C_{2-12} alkoxyalkyl group, a tetrahydrofurfuryl group, a glycidyl group, a $—CH_2—CH—O)_mR_7$, wherein R_7 is a C_{1-8} alkyl group and m is an integer of 1 to 30, or a C_{3-20} dialkylaminoalkyl group, and

R_5 represents a hydrogen atom or a $—COOR_8$ group wherein R_8 is a hydrogen atom or a C_{1-20} alkyl group,

based on the total weight of the linear copolymer and 0 to about 88% by weight of recurring units of at least one of Formulae (C^1), (C^2) and (C^3),


(C^1)


(C^2)

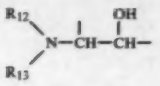

(C^3)

wherein

V and W each independently is a hydrogen atom, a C_{1-8} alkyl group, a phenyl group or a halogen atom,

based on the total weight of the linear copolymer,

(ii) about 0.1 to about 10% by weight of an amine-modified epoxy compound where all or part of the epoxy group has been replaced by the unit of Formula (I),



(I)

wherein

R_{12} and R_{13} each independently is a hydrogen atom, a C_{1-20} alkyl group, a C_{3-10} cycloalkyl group, a C_{1-12} hydroxyalkyl group, a C_{1-15} aminoalkyl group, a $H—NH—CH_2—CH_2)_n$ wherein n is an integer of 1 to 8, a C_{6-15} aryl group or a C_{7-12} arylalkyl group,

based on the weight of the linear copolymer and

(iii) about 0.05 to about 12% by weight of a blocked polyisocyanate where all or part of the isocyanate groups has been replaced by an alcohol and/or an amine, based on the total weight of the linear copolymer.

4,376,688

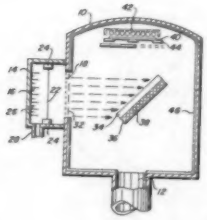
METHOD FOR PRODUCING SEMICONDUCTOR FILMS

Gerald P. Ceasar, Rochester, and Scott F. Grimshaw, Fulton, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1981, Ser. No. 254,342

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 S 16 Claims



1. A method for producing semiconducting films on a substrate comprising generating a plasma of reactive gas, extracting, accelerating and directing an ion beam from said plasma toward a target of material of which the film is to be formed, said target being maintained in a vacuum chamber at reduced pressure, sputtering said target with said reactive ion beam to sputter the target material, collecting said sputtered target material as a film on said substrate, said substrate being physically isolated from the plasma generating process and the sputtering process.

4,376,689

COENZYME IMMOBILIZED ELECTRODE

Kenichi Nakamura, Hirakata; Shiro Nankai, Neyagawa, and Takashi Iijima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 194,271, Oct. 6, 1980, Pat. No. 4,321,123, which is a continuation of Ser. No. 32,929, Apr. 19, 1979, abandoned. This application Nov. 13, 1981, Ser. No. 321,326

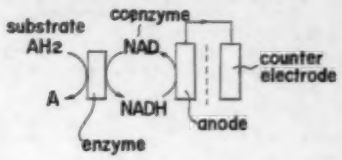
Claims priority, application Japan, Apr. 21, 1978, 53-47984; Apr. 21, 1978, 53-47985

Int. Cl.³ C12Q 1/26

U.S. Cl. 204—195 B 3 Claims

1. A process for preparing a coenzyme immobilized electrode, which comprises (1) providing a carrier adapted to immobilize, through covalent bonding, a coenzyme of oxidoreductase, said coenzyme being selected from the group consisting of NAD and NADP, (2) immobilizing said coenzyme on said carrier, (3) mixing said carrier, having said coenzyme immobilized thereon through covalent bonding, with an electron collector, and (4) press-molding the resultant mixture to form a coenzyme electrode.

2. A coenzyme immobilized electrode comprising at least a coenzyme of oxidoreductase, an electron collector and a carrier, said coenzyme, which is selected from the group consisting of NAD and NADP, being immobilized through covalent bonding on said carrier which is mixed with said electron collector, said immobilized coenzyme being in electrical contact with said electron collector.



4,376,690

CATHODE FOR A CELL FOR FUSED SALT ELECTROLYSIS

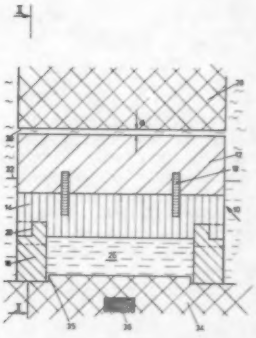
Tibor Kugler, Thayngen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 11, 1981, Ser. No. 262,049

Claims priority, application Switzerland, May 23, 1980, 4038/80

Int. Cl.³ C25C 3/08; C25B 11/02, 11/10

U.S. Cl. 204—243 R 30 Claims



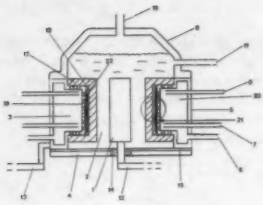
1. A cathode of individually exchangeable elements for a fused salt electrolytic cell for the production of molten aluminum from a molten electrolyte which comprises two parts made of different materials rigidly joined together with an upper part adapted to project from the molten electrolyte into the precipitated aluminum and a lower part, wherein the level of precipitated aluminum is adapted to be above said lower part, wherein at least the surface of the upper part is made of a material which at the working temperature is a good electrical conductor, is chemically resistant and is wet by aluminum, and at least the surface of the lower part is made of an insulating material which is resistant to liquid aluminum.

4,376,691

ELECTROLYTIC CELL ESPECIALLY FOR CHLORALKALI ELECTROLYSIS WITH AIR ELECTRODE

Olle Lindstrom, Lorensviksvagen 14, S-18363 Täby, Sweden

PCT No. PCT/SE79/00043, § 371 Date Nov. 2, 1979, § 102(e) Date Nov. 2, 1979, PCT Pub. No. WO79/00688, PCT Pub. Date Sep. 20, 1979
PCT Filed Mar. 1, 1979, Ser. No. 187,845
Claims priority, application Sweden, Mar. 2, 1978, 7802414
Int. Cl.[3] C25B *9/00, 11/03, 11/08, 13/06*
U.S. Cl. 204—265 5 Claims



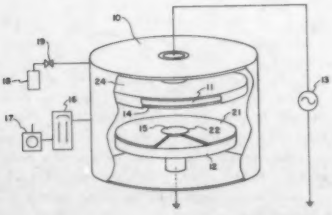
1. An electrolytic cell comprising:
a housing;
an anolyte chamber in said housing;
an anode disposed within said anolyte chamber;
at least one cathode spaced from said anode with at least one portion of the cathode being adjacent said anolyte chamber, the cathode including a cathode chamber;
means to supply and remove oxygen from the cathode chamber;
means to discharge an alkali hydroxide catholyte solution from the cathode chamber; and
a multi-layer wall defining a boundary between the anolyte chamber and the interior of said cathode chamber comprising a permeable separator material adjacent said anolyte chamber, a foraminous electrically conductive supporting material adjacent the interior of said cathode chamber, and at least partially hydrophobic electrocatalytically active material suitable for the reduction of oxygen adjacent said separator material and said supporting material.

4,376,692

DRY ETCHING DEVICE COMPRISING A MEMBER FOR BRINGING A SPECIMEN INTO ELECTRICAL CONTACT WITH A GROUNDED ELECTRODE

Tsutomu Tsukada, and Katsumi Ukai, both of Fuchu, Japan, assignors to Anelva Corporation, Fuchu, Japan

Filed Dec. 12, 1980, Ser. No. 215,805
Claims priority, application Japan, Dec. 15, 1979, 54-162176
Int. Cl.[3] C23F *1/00*; C23C *15/00*
U.S. Cl. 204—298 4 Claims



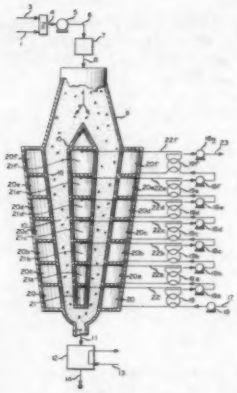
1. A dry etching device for etching a substantially conductive specimen by the use of a gas plasma, said device comprising a chamber defining therein a hollow space adapted to be exhausted and then filled with a preselected reactive gas; a first electrode positioned in said space and having a first surface; a second electrode positioned in said space and having a second surface opposite to said first surface; means for applying an RF voltage of predetermined frequency to said first electrode with said second electrode grounded to thereby develop said gas plasma in said space between said first and said second surfaces; and a dielectric plate member having a back surface brought into contact with said second surface and a front surface directed towards said first surface, the improvement wherein said plate member includes positioning means for positioning said specimen in contact with said second surface to substantially ground said specimen.

4,376,693

SOLID LIQUID EXTRACTION

F. Morgan Warzel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 13, 1981, Ser. No. 282,769
Int. Cl.[3] C10G *1/04*
U.S. Cl. 208—11 LE 18 Claims



1. An extraction process comprising
(a) introducing a mixture of solid particulate material and extractable products into a housing,
(b) passing said mixture in a plug flow manner along a flow path through a series of connected replacement zones in said housing, wherein these zones are portions of the flow path and are interconnected in such a manner as to have essentially no obstruction within the entire flow path,
(c) releasing at each of the respective replacement zones a stream of an inlet fluid into contact with said mixture, said inlet fluid comprising a significant amount of solvent capable of replacing at least a portion of said product present in said mixture,
(d) passing said inlet fluid through said solid material in a cross-flow direction with respect to the flow direction of the mixture,
(e) withdrawing from each replacement zone a stream of an outlet fluid comprising a significant amount of solvent and a larger amount of extracted products compared to said inlet fluid, thereby replacing in each replacement zone at least a portion of the fluid and/or extractable products present in said mixture entering the respective replacement zone, by said inlet fluid,
(f) recovering at least one of said outlet streams as the product of the process, and
(g) withdrawing a mixture comprising solid particulate material and solvent but being depleted of extractable products from said housing.

4,376,694

METHOD OF DECOKING A CRACKING PLANT

Bernhard Lohr, Saarbrücken; Peter Hesse, and Robert Schuster, both of Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 156,608, Jun. 5, 1980, abandoned. This application Jul. 8, 1981, Ser. No. 281,344
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923326; Aug. 27, 1979, 2934570
Int. Cl.³ C10G 9/12, 9/16
U.S. Cl. 208—48 R 6 Claims

1. A method of operating a hydrocarbon cracking installation in which a cracking furnace is followed by a cracking gas cooler, said method comprising the steps of:

(a) subjecting a hydrocarbon feedstock to a cracking temperature in said furnace by heating cracking tubes in said furnace and passing said feedstock therethrough, thereby producing cracking gases;

(b) passing said cracking gases through said cooler while supplying said cooler with a coolant to reduce the temperature of said cracking gases, surfaces of said cracking tubes and said cooler developing carbonaceous deposits;

(c) while further heating said furnace and cooling said surfaces of said cooler with said coolant, interrupting the passage of said feedstock through said cracking installation, feeding a gas mixture of oxygen and steam through said cracking tubes and at least a portion of the flow cross section of said cooler, thereby effecting substantial reduction of said carbonaceous deposits in said cracking tubes;

(d) thereafter, while continuing to heat said furnace and cool said surfaces of said cooler, increasing the mass rate of flow of said gas mixture until the temperature in said cooler increases so far that carbonaceous deposits in said cooler are subjected to a watergas reaction; and

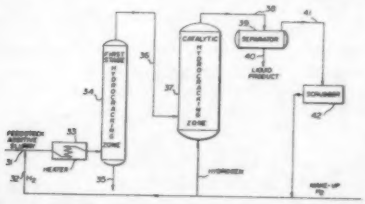
(e) continuing step (d) until said carbonaceous deposits are removed from said cracking installation.

4,376,695

SIMULTANEOUS DEMETALIZATION AND HYDROCRACKING OF HEAVY HYDROCARBON OILS

Keith Belinko; David J. Patmore; Rodney H. Packwood, and Ramaswami Ranganathan, all of Ottawa, Ontario, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Ontario, Canada

Filed Apr. 23, 1981, Ser. No. 256,855
Claims priority, application Canada, Feb. 12, 1981, 370766
Int. Cl.³ C10G 47/10
U.S. Cl. 208—59 7 Claims



1. A process for simultaneous demetalization and hydrocracking of a heavy hydrocarbon oil, a substantial portion of which boils above 524° C., which comprises:

(a) passing a slurry of said heavy hydrocarbon oil and from about 0.01 to 25 wt % of carbonaceous additive particles in the presence of hydrogen through a confined vertical hydrocracking zone, said hydrocracking zone being maintained at a temperature between about 400° and 500° C., a pressure of at least 3.5 MPa and a space velocity of up to 4 volumes of hydrogen oil per hour per volume of hydrocracking zone capacity,

(b) causing the carbonaceous particles within the hydrocracking zone to undergo partial liquifaction leaving porous particles of carbonaceous material and mineral matter which are inert to further hydrogenation and depositing within the porous network of said porous particles metal-containing residues from the feedstock, thereby causing said porous particles to increase in density and settle to the bottom of the hydrocracking zone,

(c) removing from the top of said hydrocracking zone a mixed effluent containing a gaseous phase comprising hydrogen and vaporous hydrocarbons and a liquid phase comprising heavy hydrocarbons, and

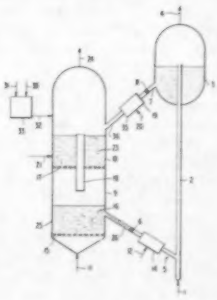
(d) removing from the bottom of said hydrocracking zone a portion of the hydrocracking zone contents containing said porous particles with adsorbed metal-containing residues from the feedstock.

4,376,696

ADDITION OF $MGCL_2$ TO CATALYST FOR CRACKING CARBO-METALLIC FEED OILS

George D. Myers, deceased, late of Ashland, Ky. (by Virginia K. Myers, administratrix), assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 94,092, Nov. 14, 1979, Pat. No. 4,332,673, and Ser. No. 94,216, Nov. 14, 1979, Pat. No. 4,341,624. This application Mar. 23, 1981, Ser. No. 246,751
Int. Cl.³ C10G 11/05, 11/08
U.S. Cl. 208—120 65 Claims



1. A process for economically converting carbo-metallic oils to lighter products in a system comprising a progressive-flow reactor and a catalyst regenerator comprising:

I. providing a converter feed containing 650° F.+ material, said 650° F.+ material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 4 parts per million of Nickel Equivalents of heavy metal(s);

II. bringing said converter feed together with particulate cracking catalyst to form a stream comprising a suspension of said catalyst in said feed and causing the resultant stream to flow through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds at a temperature of about 900° to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

III. separating agent, coke-laden catalyst from the stream of hydrocarbons formed by vaporized feed and resultant cracking products;

IV. maintaining, in one or more regeneration zones, one or more fluidized catalyst regeneration beds comprising

spent catalyst undergoing regeneration by combustion of the coke with oxygen on the spent catalyst, and supplying additional spent catalyst to one or more of such fluidized regeneration bed or beds;

V. retaining said catalyst particles in said regeneration zone or zones in contact with a flow of said combustion-supporting gas under conditions of temperature, atmosphere and average total residence time in said zone or zones sufficient for combustion of the coke on the catalyst and for reducing the level of carbon on the catalyst to about 0.25% by weight or less, while forming gaseous combustion product gases comprising CO and/or CO_2;

VI. recycling the regenerated catalyst to the reactor for contact with fresh feed; and

VII. adding $MgCl_2$ to said system.

4,376,697

FLUID CATALYTIC CRACKING

Joe E. Penick, Chappaqua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 861,146, Dec. 16, 1977, abandoned, which is a continuation of Ser. No. 653,167, Jan. 28, 1976, Pat. No. 4,064,039. This application Oct. 1, 1981, Ser. No. 308,076

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.³ C10G *11/05, 11/18*

U.S. Cl. 208—120 **8 Claims**

1. In a fluid catalytic cracking process for non-hydrogenative, endothermic cracking of hydrocarbons, which process comprises: co-feeding hot active zeolite/amorphous cracking catalyst and feed hydrocarbons to a reaction zone, said co-feeding being conducted at a catalyst/oil ratio directly or indirectly controlled by the temperature of said hot active cracking catalyst; cracking said feed while depositing coke on said catalyst; separating said coked catalyst from the cracked product; passing said coked catalyst to a regeneration zone wherein is formed a dense fluidized bed of said catalyst; introducing an oxygen containing gas to said regeneration zone; intimately mixing said gas and said coked catalyst at a temperature and for a time sufficient to burn coke off said catalyst, heat and reactivate such, and produce a flue gas comprising carbon monoxide and returning said reactivated, heat catalyst to said reaction zone; the improvement, whereby eliminating said carbon monoxide from said flue gas, and increasing conversion and/or gasoline yield, which comprises:

providing a cracking catalyst having incorporated therewith up to about 50 parts per million of at least one platinum group metal;

providing sufficient increased oxygen to said regeneration zone to combust substantially all of said carbon monoxide to carbon dioxide in said dense bed of said regeneration zone, whereby adding heat to said catalyst in said regeneration zone; and

cooling at least a portion of said catalyst in said regeneration zone to remove at least some of said added heat.

4,376,698

CATALYTIC HYDRODESULFURIZATION OF ORGANIC COMPOUNDS EMPLOYING PROMOTED ZINC TITANATE

Lloyd E. Gardner; Floyd E. Farha, Jr., and Alan D. Eastman, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 125,429, Feb. 18, 1980, abandoned. This application Apr. 30, 1981, Ser. No. 259,283

Int. Cl.³ C10G *45/04*

U.S. Cl. 208—215 **25 Claims**

1. A process for the catalytic hydrodesulfurization of an organic sulfur compound comprising the step of contacting said organic sulfur compound under suitable hydrodesulfurization conditions with a catalyst composition comprising zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium, and compounds thereof, wherein the concentration by weight of said at least one promoter in said catalyst composition is less than the total concentration by weight of said zinc and said titanium in said catalyst composition and wherein said catalyst composition is prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of molecular oxygen at a temperature in the range of about 650° C. to about 1050° C. to form zinc titanate, adding said at least one promoter to said zinc titanate to form a promoted zinc titanate and completely sulfiding said promoted zinc titanate to form said catalyst composition.

4,376,699

CATALYTIC HYDROCRACKING, HYDRODESULFURIZATION, AND/OR HYDRODENITROGENATION OF ORGANIC COMPOUNDS EMPLOYING PROMOTED ZINC TITANATE AND A ZEOLITE AS THE CATALYTIC AGENT

Lloyd E. Gardner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 145,639, May 1, 1980, Pat. No. 4,324,647. This application Jan. 18, 1982, Ser. No. 340,150

Int. Cl.³ C10G *45/08, 45/10, 45/12*

U.S. Cl. 208—215 **18 Claims**

1. A process for the catalytic hydrodesulfurization of an organic sulfur compound comprising the step of contacting said organic sulfur compound under suitable hydrodesulfurization conditions with a catalyst composition comprising zeolite, zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium, and compounds thereof.

4,376,700

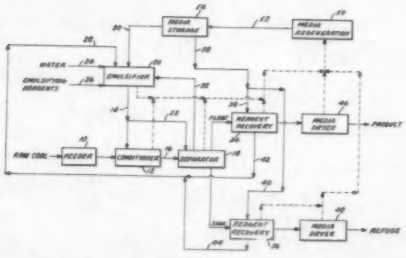
METHOD FOR BENEFICIATING COAL ORE

Stanton D. Irons, Northampton, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 52,152, Jun. 26, 1979, abandoned. This application Oct. 7, 1980, Ser. No. 194,742

Int. Cl.³ B03B *5/44*

U.S. Cl. 209—17 **6 Claims**



1. A float and sink method for separating coarse coal particles from gangue in a coal ore wherein the coarse coal particles report as a float product and the gangue reports as a sink product in a separating device containing a heavy medium liquid, comprising:

(a) comminuting the coal ore to provide coarse and fine particles therein to a size consist of $-\frac{1}{4}$ inch by 0,

(b) separating the comminuted particles into coarse particles having a size consist of $-\frac{1}{4}$ inch by $+48$ m from the fine particles having a size consist of -48 m by 0 in a screening step,

(c) charging the coarse particles into the separating device containing a heavy medium liquid consisting of a water-trichlorofluoromethane emulsion having a specific gravity

intermediate the specific gravities of the coal particles and gangue,

(d) separating the coarse coal particles as a float product and the gangue as a sink product,

(e) recovering the coarse coal particles and

(f) passing the gangue to further processing.

4,376,701

WASTE WATER TREATING APPARATUS

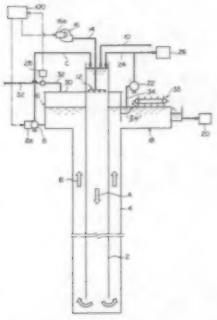
Tadao Fujimoto, Kobe; Tadaaki Kawasugi, Nara; Taketoshi Madokoro, Kyoto, and Akio Toriyama, Sakai, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 2, 1981, Ser. No. 239,418

Claims priority, application Japan, Mar. 7, 1980, 55-30269[U]; Mar. 8, 1980, 55-29532[U]

Int. Cl.³ C02B *1/34*

U.S. Cl. 210—96.1 **14 Claims**



1. A waste water treating apparatus for treating waste water including an organic material, comprising: a downward flow chamber (2) disposed to extend in the depth direction for allowing a downward flow of a mixed liquor comprising said waste water to be treated and an activated sludge, an upward flow chamber (4) disposed in the depth direction outside and adjacent to said downward flow chamber for allowing an upward flow of said mixed liquor to be supplied through said downward flow chamber, circulation means (8) for circulating said mixed liquor through said upward flow chamber and through said downward flow chamber by raising said mixed liquor from said upward flow chamber to said downward flow chamber, gas supply means (16) for supplying an oxygen containing gas into said downward flow chamber, organic loading representing information providing means (28) operatively coupled to at least one of said upward flow chamber and said downward flow chamber for providing information associated with an organic loading of said waste water, first controlling means (16*a*, 100) responsive to said information from said organic loading representing information providing means (28) for controlling said oxygen containing gas supply means (16) so that a controlled quantity of supplied oxygen containing gas is the quantity necessary for treating said organic loading of the waste water in accordance with said organic loading associated information, and second controlling means (8*a*, 100) responsive to said controlled quantity of supplied oxygen containing gas for controlling said mixed liquor circulation means (8) so that the circulation flow rate of said mixed liquor is suitable for treatment by said controlled quantity of supplied oxygen containing gas.

4,376,702

WASTE DISPOSAL APPARATUS

Stuart H. Small, Hjorung Veien 9, Oslo 3, Norway

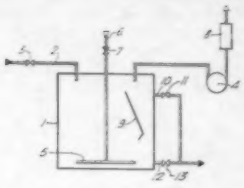
PCT No. PCT/GB80/00111, § 371 Date Mar. 2, 1981, § 102(e) Date Feb. 12, 1981, PCT Pub. No. WO81/00102, PCT Pub. Date Jan. 22, 1981

PCT Filed Jul. 1, 1980, Ser. No. 237,121

Claims priority, application United Kingdom, Jul. 2, 1979, 7922872

Int. Cl.³ C02F *3/02*

U.S. Cl. 210—201 **7 Claims**



1. Waste disposal apparatus suitable for the collection of waste from a vacuum sewer system, which comprises a tank having a waste inlet and a waste outlet, an air inlet, a separate liquid outlet near the top of the tank, and a single vacuum means for reducing pressure in the tank such that, in use, the waste inlet is above the level of waste in the tank and reduced pressure is maintained above the waste level and waste can thereby be drawn through the waste inlet, and such that, in use, the air inlet is below the level of waste in the tank, and air can be caused to pass into, and thereby cause aerobic digestion of, waste in the tank.

4,376,703

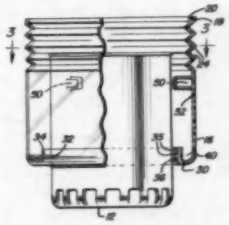
OIL FILTER COVER

Leonard Krauss, 4204 Melisa Ct., Carmichael, Calif. 95608

Filed Nov. 10, 1981, Ser. No. 320,082

Int. Cl.³ B01D *27/00*

U.S. Cl. 210—238 **7 Claims**



1. In combination with a screw-on type oil filter including a generally cylindrical housing having first and second ends and including first threaded connecting means at said first end for threaded connection with and unthreading connection from an oil filter mounting location including second threaded connecting means to be threadingly engaged by said first threaded connecting means, an oil catching and retaining cover, said cover including a tubular body having first and second open ends and loosely telescopingly engaged over said filter from the second end thereof with said body first end spaced outward from said housing first end and said body second end disposed about an intermediate portion of said housing disposed between the first and second ends thereof, said body second end including a generally annular end wall partially closing said second end of said body, being disposed about said housing intermediate portion and including seal means frictionally

engaging said intermediate portion and forming a reasonably good fluid tight seal between the inner periphery of said annular end wall and said housing intermediate portion, said housing being constructed of fluid impervious material and including a yieldingly axially compressable and integral bellows portion intermediate said annular end wall and said first body end, said body first end including axially outwardly facing seal means for forming a reasonably good fluid tight seal with said oil filter mounting location.

4,376,704

VACUUM DOUBLE DRUM FILTER

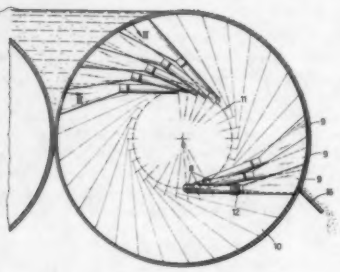
Wilhelm Otte, and Reinhold Winckowski, both of Bochum, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,611

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010682

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—326 **4 Claims**



1. A vacuum double drum filter comprising in combination:

a pair of parallel porous rotational filter drums in close running relationship forming an upwardly facing working gap between them for receiving material to be filtered;

means for delivering material to said working gap;

vacuum extraction tubes within each drum for carrying away filtrate, said tubes having inner ends for discharging to a vacuum source through a central head of each drum and said inner end being located radially displaced from the center of the respective drum so that the tubes are angled in the direction of drum rotation; and

wedge shaped collecting pockets tapered gradually and uniformly from an outer opening to an inner opening with the outer opening against the inner surface of the drums facing the material in the working gap and leading radially inwardly to the inner opening connecting to said tubes,

said pockets extending at an angle to a radial line from each drum center to the location of the open opening to be angled in the direction of rotation of each drum.

4,376,705

FILTERING AND DRYING APPARATUS

Kisaburo Komura; Masamitsu Ohshima, both of Aichi, and Masato Matsuda, Kuwana, all of Japan, assignors to Nippon Dyeing Machine Manufacturing Co. Ltd., Ama, Japan

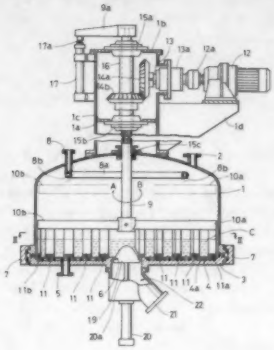
Filed Sep. 11, 1981, Ser. No. 301,207

Claims priority, application Japan, Sep. 19, 1980, 55-131063

Int. Cl.³ B01D *25/38*

U.S. Cl. 210—413 **10 Claims**

1. A filtering and drying apparatus adapted for use in filtration of slurry liquids and in drying of cakes produced through the filtration of slurry liquids, comprising a vertically disposed casing, a bottom plate detachably carried at the bottom of said casing and supporting a filter plate thereon, a valve chamber provided at the central portion of said bottom plate and adapted for discharging the cakes, and an upright rotary shaft disposed in the center of said casing for vertical movement along its own axis and for forward and reverse rotations about its own axis, said rotary shaft being provided at the lowermost end thereof with at least a pair of rotary arms extending at right



angles to said rotary shaft and having a plurality of stirring blades, said stirring blade having on one side thereof a face effective to scrape off the cakes to the right and left and on the other side thereof a face effective to move the cakes toward the central portion of said bottom plate.

4,376,706

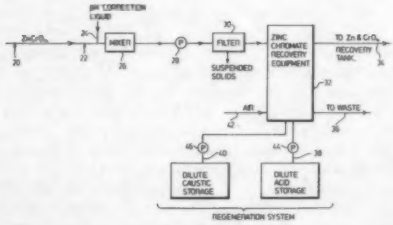
CHROMIUM AND ZINC REMOVAL AND RECOVERY BY ION EXCHANGE

Terrence I. Scott, Mississauga; Vincent H. Westlake, and Michael K. Bridle, both of Calgary, all of Canada, assignors to Petro-Metals Recovery Systems Limited, Toronto, Canada

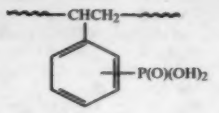
Continuation of Ser. No. 26,323, Apr. 2, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,271

Int. Cl.³ C02F *1/42*

U.S. Cl. 210—678 **35 Claims**



1. In a process for the selective recovery from effluent, of zinc and chromium in their ionic forms, by ion exchange, the step of passing the effluent through a fixed bed of anion exchange resin and cation exchange resin, in the same ion exchange vessel, the anion exchange resin being selective of chromium and the cation exchange resin being an intermediate acid cation exchange resin with a phosphonic acid functional group on a cross-linked polystyrene matrix having the repeating structural formula:



selective of zinc.

4,376,707

PROCESS FOR THE REMOVAL OF UREA FROM BLOOD WASH FLUIDS AND BLOOD

Hans-Dieter Lehmann, Waltenhofen, Fed. Rep. of Germany, assignor to Gambro Dialysatoren G.m.b.H. & Co. K.G., Fed. Rep. of Germany

Filed May 21, 1979, Ser. No. 243,968
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—679 9 Claims

1. A process for removing urea from blood wash fluid or blood fluid comprising the steps of treating said fluid with an organic solid containing at least one aldehyde group per molecule and at least one proton-containing secondary substituent group which masks and activates said aldehyde group to effect urea removal from said fluid, and separating said fluid from said organic solid.

4,376,708

FLOTATION PROCESSES USING UREYLENES

Thomas J. Bellos, Kirkwood, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 124,998, Feb. 26, 1980, Pat. No. 4,303,780.
This application May 11, 1981, Ser. No. 262,249
Int. Cl.³ C02F *1/24*
U.S. Cl. 210—705 6 Claims

1. A flotation process of removing particulate matter from an aqueous system which comprises employing a ureylene derived from first reacting a polyamine with about 0.5 to 0.8 mole of an oxyalkylating agent per NH equivalents of said polyamine, and thereafter reacting said oxyalkylated polyamine with urea.

4,376,709

INTERCALATED LAYERED MIXED OXIDES

Jack W. Johnson, Fanwood, and Allan J. Jacobson, Princeton, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 10, 1980, Ser. No. 205,456
Int. Cl.³ C07F *7/00*
U.S. Cl. 252—1 11 Claims

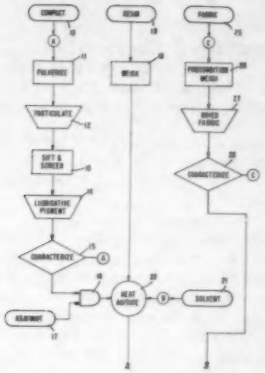
1. A composition of matter which comprises a cation intercalated in a layered mixed oxide having layers of corner linked octahedra and tetrahedra, said composition having the formula $A_qMOXO_4 \cdot nH_2O$ where A is a metallic monovalent, divalent or polyvalent cation selected from Groups IA–VIA, IB–VIIB and VIII of the Periodic Table or A is a non-metallic monovalent, divalent or polyvalent cation selected from Groups IVA–VIIA of the Periodic Table; $MOXO_4$ is a layered mixed oxide selected from the group consisting of $VOPO_4$, $VOSO_4$, $VOAsO_4$, $VOMoO_4$, $NbOPO_4$, $NbOAsO_4$, $TaOPO_4$ and $MoOPO_4$; n is a number from 0 to 4 and q is a number from about 0.001 to about 1.0.

4,376,710

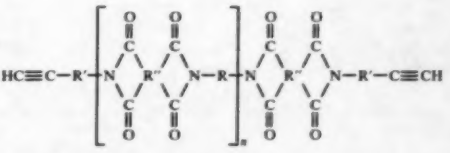
HIGH LOAD CARRYING POLYIMIDE LUBRICATIVE COMPOSITES

Michael N. Gardos, Palms, and Arturo A. Castillo, La Puente, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 30, 1981, Ser. No. 249,243
Int. Cl.³ C10M *5/20*
U.S. Cl. 252—12.4 7 Claims



1. High load capacity, high temperature lubricative composites comprising a multidimensional weave preform, prepared from carbon fibers, graphite fibers or a combination thereof, modified by the addition of an adjuvant consisting essentially of diammonium hydrogen phosphate, and impregnated with a thermally stable high temperature polyimide resin containing lubricative pigments that are oxidatively stable in air up to 1,000° F. wherein said polyimide resin is derived from an acetylene terminated polyimide oligomer whose general structure is



where R'' is phenylene —CO— phenylene, R' is phenylene, R is phenylene oxyphenylene oxyphenylene and n is 1.

4,376,711

LUBRICANT COMPOSITION

Harold Shaub, New Providence, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 931,666, Aug. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 791,284, Apr. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 707,495, Jul. 22, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,621
Int. Cl.³ C10M *1/26*
U.S. Cl. 252—32.7 E 14 Claims

1. A lubricating oil composition comprising a base oil, from about 0.01 to about 1.0 parts by weight of an hydroxy-substituted ester of a polycarboxylic acid with a glycol per 100 parts of base oil, said acid having a hydrocarbon portion containing from about 9 to about 42 carbon atoms between carboxyl groups and said glycol is selected from the group consisting of alkylene glycols having from about 2 to about 12

carbon atoms and polyalkylene glycols having from about 4 to about 200 carbon atoms and from about 0.01 to about 5.0 parts by weight, per 100 parts of base oil, of a metal dialkyl dithiophosphate, wherein the alkyl portion of said metal dialkyl dithiophosphate contains between about 1 and about 18 carbon atoms and said metal is a metal whose oxide exhibits a Mohs hardness of about 3.0 or less.

4,376,712

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 128,758, Mar. 10, 1980, abandoned. This application Oct. 15, 1981, Ser. No. 311,582

Int. Cl.³ C10M *1/54*; C07F *5/04*

U.S. Cl. 252—49.6 **18 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor effective amount of an additive having friction reducing, anticorrosion, and antioxidant properties comprising a borated sorbitan mono-, di- or triester or mixture of such borated sorbitan esters wherein the ester group or groups thereof comprise a hydrocarbyl radical having from about 10 to about 30 carbon atoms.

4,376,713

AC ELECTROLYTIC CAPACITOR ELECTROLYTE

Franz S. Dunkl, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 21, 1977, Ser. No. 862,713

Int. Cl.³ H01G *9/02*

U.S. Cl. 252—62.2 **2 Claims**

1. An electrolyte for an aluminum AC motor-start capacitor consisting essentially of 10 to 40 wt % of a solute selected from mono-diethyl-ammonium adipate and mono-triethylammonium adipate and as solvent, ethylene glycol and a minor amount of water, said electrolyte having a resistivity measured at 25° C. of 475 to 1039 ohm-cm.

4,376,714

PROCESS FOR PREPARING ACICULAR IRON OXIDE PARTICLES

Bernard J. Pingaud, Vincennes, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1980, Ser. No. 204,722

Claims priority, application France, Jul. 24, 1980, 80 16332

Int. Cl.³ C01G *49/06*, *49/08*

U.S. Cl. 252—62.56 **23 Claims**

1. In a process for preparing acicular magnetic iron oxide particles comprising (a) adding an aqueous solution of ferrous salt to an aqueous solution of a stoichiometric excess of alkaline hydroxide while substantially avoiding local excesses of said ferrous salt, to form an aqueous dispersion of ferrous hydroxide particles, (b) oxidizing said particles to form non-magnetic alpha ferric oxide hydrate particles, and (c) converting said non-magnetic particles to magnetic iron oxide particles by dehydration and reduction or dehydration, reduction and oxidation, the improvement wherein said ferrous salt solution is subjected to reducing conditions prior to or during said addition to reduce contaminating ferric ions present therein to ferrous ions.

4,376,715

COMPOSITION BASED ON LIQUID CRYSTAL FOR ELECTRO-OPTICAL DEVICE

Jacques Cognard, Chezard, and Trung H. Phan, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Jul. 25, 1980, Ser. No. 172,641

Claims priority, application Switzerland, Aug. 17, 1979, 7543/79

Int. Cl.³ C09K *3/00*; C07C *49/68*

U.S. Cl. 252—301.16 **1 Claim**

1. A composition based on liquid crystal and designed for use in an electro-optical device, that contains as pleochroic dye an anthraquinone compound selected from the group consisting of 4,8-diamino-1,5-dihydroxy-2,6-di(p-butoxy-phenyl)-anthraquinone and 4,8-diamino-1,5-dihydroxy-3-p-butoxyphenyl-anthraquinone.

4,376,716

PREPARATION OF STABLE SODIUM CARBONATE DISPERSIONS

Robert Kaiser, Winchester, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 18, 1974, Ser. No. 488,887

Int. Cl.² B01J *13/00*

U.S. Cl. 252—309 **1 Claim**

1. A method of preparing a stable microdispersion of sodium carbonate particles in hexane which comprises the steps of:

(A) forming a mixture of (1) hexane and (2) a phosphoro-sulfurized polybutene stabilized, non-volatile, sodium carbonate oil dispersion;

(B) adding acetone to said mixture to form a flocculated colloidal precipitate;

(C) separating said precipitate from said mixture by decanting the said acetone;

(D) mixing said separated precipitate with hexane to form a colloidal suspension; and

(E) concentrating the said colloidal suspension by centrifugation and distilllation to effect the formation of said stable microdispersion of sodium carbonate in hexane.

4,376,717

PROCESS FOR THE PREPARATION OF GASES WHICH CONTAIN HYDROGEN AND NITROGEN

Vincenzo Lagana', Milan; Francesco Saviano, Segrate, and Piero Bisi, Paderno Dugnano, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Dec. 11, 1980, Ser. No. 215,167

Claims priority, application Italy, Aug. 29, 1980, 24358 A/80

Int. Cl.³ C01B *2/30*

U.S. Cl. 252—376 **5 Claims**

1. A process for the preparation of gases which contain hydrogen and nitrogen starting from natural gas or virgin naphtha by steam reforming in two stages and subsequent air reforming in one stage, comprising feeding said natural gas or virgin naphtha to the first steam reforming stage at a temperature of from 400° C. to 650° C. and converting from 20% to 50% thereof in said first steam reforming stage, removing the partially converted natural gas or virgin naphtha from said first steam reforming stage at a temperature between 650° C. and 750° C. and feeding the same to the second steam reforming stage, raising the conversion of said partially converted natural gas or virgin naphtha up to 70% in said second steam reforming stage, removing the partially converted natural gas or virgin naptha from said second steam reforming stage at a temperature between 750° C. and 850° C. and feeding the same to the air reforming stage, further converting the partially converted natural gas or virgin naphtha with burning air in said air reforming stage, raising and maintaining the temperature thereof to a temperature between 920° C. and 1050° C. in said air reforming stage, producing a gas having a temperature

which is sufficient to actuate the second stage of said steam reforming and employing the sensible heat of the effluent gases from the air reforming to actuate the second stage of steam reforming.

4,376,718

PROCESS FOR ACTIVATING OR REACTIVATING ETHYLENE OXIDE SILVER SUBSTRATE CATALYSTS

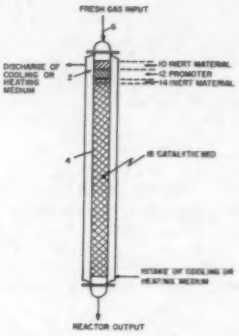
Erwin Vangermain, and Claus-Dieter Mengler, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls A.G., Marl, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 136,045

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916887

Int. Cl.³ B01J *23/96, 23/66, 23/02;* **C07D** *301/10*

U.S. Cl. 252—416 **8 Claims**



1. In a process for activating or reactivating silver substrate catalysts having promoter metals therein used in the production of ethylene oxide by oxidizing a mixture of gases containing ethylene and an oxygen containing gas where the mixture of gases is passed over said silver substrate catalysts in a catalyst zone and defines a flow path, the improvement comprising:

locating a promoter bed containing uniformly distributed compounds of the promoter metals in at least a portion of said flow path of said mixture of gases and in front of said catalyst zone.

2. The process of claim 1, wherein said promoter metal compounds are deposited on a substrate material.

3. The process of claim 1, wherein said promoter metal compounds are deposited on a substrate material which is the same as that of the silver substrate catalyst.

4,376,719

PROCESS FOR THE PRODUCTION OF AQUEOUS DISPERSIONS OF SOLID FREE RADICAL-GENERATING INITIATORS

Donald Goodman, Flemington, N.J.; Mario Q. Ceprini, Cedarhurst; Samuel Hoch, Brooklyn, both of N.Y., and Marvin Koral, Warren, N.J., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Jul. 15, 1981, Ser. No. 283,589

Int. Cl.³ C08F *4/34, 4/04, 14/06, 2/20*

U.S. Cl. 252—426 **5 Claims**

1. The process for the production of stable aqueous dispersions of free radical-generating polymerization initiators that are solid at temperatures above 0° C. that comprises the steps of

(a) forming a suspension that contains from 10% to 40% by weight of a free radical-generating polymerization initiator that is solid at temperatures above 0° C. in an aqueous medium that comprises from 1% to 5% by weight of a suspending agent selected from the group consisting of water-soluble cellulose derivatives, gelatin, polyvinyl alcohol, starch, methyl vinyl ether-maleic anhydride copolymers, vinyl acetate-maleic anhydride copolymers, metal salts of carboxymethylcellulose and polyacrylic acids, and mixtures thereof; from 0.1% to 2% by weight of a wetting agent selected from the group consisting of polyoxyethylene alkyl ethers, polyoxyethylene alkyl esters, polyoxyethylene alkyl aryl ethers, sorbitan alkyl esters, polyoxyethylene-propylene glycol ethers, polyoxyethylenesorbitan alkyl esters, fatty acid monoglycerides, fatty acid soaps, sulfates, alkyl aryl sulfonates, dialkylsulfosuccinates, alkyl sulfonates, ethylene oxide adducts of alkylphenols, and mixtures thereof; and from 8% to 20% by weight of a polyalkylene glycol, said percentages being based on the weight of the suspension, and

(b) homogenizing said suspension to form a stable initiator dispersion.

2. The process of claim 1 wherein in Step (b) the suspension is at a temperature in the range of 5° to 30° C. when it is homogenized.

3. The process of claim 1 wherein the suspension formed in Step (a) contains from 20% to 30% by weight of said initiator.

4,376,720

OLEFIN POLYMERIZATION CATALYST AND OLEFIN POLYMERIZATION METHOD USING SUCH CATALYST

Hisaya Sakurai; Yoshihiko Katayama; Tadashi Ikegami, and Shigeo Tsuyama, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1980, Ser. No. 211,991

Claims priority, application Japan, Dec. 4, 1979, 54-156347; Mar. 18, 1980, 55-33364

Int. Cl.³ C08F *4/66, 10/02*

U.S. Cl. 252—430 **17 Claims**

1. A catalyst for olefin polymerization comprising:

(a) a solid component comprising a chromium compound supported by an inorganic oxide carrier, and

(b) an organomagnesium complex compound soluble in inert hydrocarbons, said compound being represented by the general formula: $M_\alpha Mg_\beta R_p{}^1R_q{}^2R_r{}^3X_sY_t$ (wherein $\alpha>0$, $\beta>0$, $p\geqq 0$, $q\geqq 0$, $r\geqq 0$, $s>0$, $t\geqq 0$, $O<(s+t)/(\alpha+\beta)\leqq 1.5$, and $p+q+r+s+t=m\alpha+2\beta$; M is an atom selected from the group consisting of aluminum, zinc, boron, beryllium and lithium; m is the valence of M; R^1, R^2 and R^3 may be same or different and represent respectively a hydrocarbon radical having 1 to 20 carbon atoms; X is $OSiR^5R^6R^7$; and Y is a group selected from OR^4, $OSiR^5R^6R^7$, NR^8R^9 and SR^{10}, wherein R^5, R^6, R^7, R^8 and R^9 represent respectively a hydrocarbon radical or hydrogen atom, and R^4 and R^{10} represent a hydrocarbon radical).

4,376,721

METHANOL SYNTHESIS CATALYST AND METHOD FOR ITS PREPARATION

Dinah C. Huang, Louisville, Ky., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 22, 1981, Ser. No. 286,204

Int. Cl.³ B01J *31/02*

U.S. Cl. 252—430 **27 Claims**

1. A composition comprising a catalytically active metal, metal oxide, metal salt or a mixture thereof which catalyzes a chemical reaction to produce methanol in the presence of gaseous carbon monoxide, hydrogen and carbon dioxide; a solid carrier comprising a catalytically inert metal oxide or a mixture of catalytically inert metal oxides; and a catalytically inert metal alkoxide coating wherein said alkoxide contains 1–10 carbon atoms.

4,376,722

ALKYLTITANIUM AND ALKYLCHROMIUM CATALYSTS FOR OLEFIN POLYMERIZATION

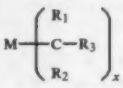
Arthur W. Chester, Cherry Hill, and James G. Murray, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,827
Int. Cl.³ C08F 4/02, 4/42
U.S. Cl. 252—430 12 Claims

1. A catalyst composition especially suitable for promoting polymerization of 1-olefins, said composition comprising the reaction product of

(A) a crystalline aluminosilicate zeolite having a silica to alumina molar ratio of at least about 12 and a Constraint Index within the approximate range of about 1 to 12; and

(B) an organometallic compound of the formula:



wherein

M is a metal selected from titanium and chromium;

R_1 and R_2 are each selected from H and methyl;

R_3 is H, alkyl, cyclohexyl, alkylcyclohexyl, cyclohexylalkyl, phenyl or alkylphenyl, benzyl and dimethylbenzyl; and

x is 3 or 4.

4,376,723

VICINAL ALKYLENE OXIDE POLYMERIZATION AND CATALYSTS THEREOF

David L. Wolfe, Midland, Mich., and Frederick P. Corson, Miami, Fla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 16, 1981, Ser. No. 274,135
Int. Cl.³ B01J 31/14
U.S. Cl. 252—431 N 13 Claims

1. A catalyst for the polymerization of vicinal alkylene oxides to high molecular weight polymers, comprising a composition prepared by contacting:

Component A, a compound represented by the formula RR'AlX wherein R and R' each independently represent an alkyl group of 1 to 4 carbon atoms, and X represents hydrogen or an alkyl or alkoxy group of 1 to 4 carbon atoms;

Component B, an organic nitrogen base compound selected from secondary nitrogen containing compounds having basicity about equal to or less than the basicity of dimethylamine and having no active hydrogen atoms other than those of the secondary nitrogen;

Component C, a beta-diketone; and

Component D, water;

in the molar ratios of

B:A—about 0.01 to 2.5:1

C:A—about 0.1 to 1.5:1

D:A—about 0.1 to 1.5:1

provided that when the molar ratio of (C+2D):A is greater than about 3:1 than the B:A molar ratio is at least about 1:1.

4,376,724

RHODIUM CATALYST AND METHOD FOR PREPARING THE SAME

Yukimitsu Mita, Oita; Ken-ichi Sano, Kawasaki; Shinya Matsuhira, and Tetsuo Nakajo, both of Oita, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1981, Ser. No. 254,074
Claims priority, application Japan, Apr. 14, 1980, 55-48131; Apr. 14, 1980, 55-48132
Int. Cl.³ B01J 23/46
U.S. Cl. 252—460 13 Claims

1. A method for preparing a rhodium catalyst containing rhodium metal in the surface layer or near the surface layer of the particles of a support, said method comprising the steps of:

(i) adding sodium hydroxide or potassium hydroxide to an aqueous solution of a water-soluble rhodium salt to adjust the pH of the aqueous solution to at least 10, whereby said water-soluble rhodium salt is converted to rhodium hydroxide;

(ii) dipping a silica type or titania type support into said aqueous solution of rhodium hydroxide; and

(iii) drying and reducing the support impregnated with rhodium hydroxide, whereby the impregnated rhodium hydroxide is reduced to rhodium metal.

4,376,725

CONDUCTOR INKS

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,917
Claims priority, application United Kingdom, Oct. 17, 1980, 8033564
Int. Cl.³ H01B 1/16
U.S. Cl. 252—512 9 Claims

1. A copper conductor ink suitable for forming a conductor film on a circuit board consisting of:

(a) from about 70 to about 90 percent by weight of copper powder;

(b) from about 1 to about 15 percent by weight of a barium calcium borosilicate glass frit;

(c) from about 0.5 to about 3 percent by weight of bismuth oxide, wherein bismuth oxide is present in admixture with the copper powder or as a component of the glass frit; and

(d) from about 6 to about 25 percent by weight of a suitable organic vehicle.

4,376,726

METHOD OF MANUFACTURING COMPOSITION FOR BONDED MAGNETS

Tadashi Sakaira, Katano; Hideyuki Yamada, Kadoma, and Tamotsu Wakahata, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1981, Ser. No. 244,322
Claims priority, application Japan, Mar. 17, 1980, 55-33796
Int. Cl.³ H01B 1/06; B01J 2/16
U.S. Cl. 252—519 9 Claims

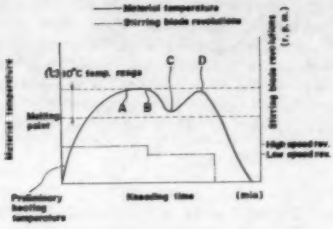
1. A method of preparing a composition for manufacturing bonded magnets, which comprises the steps of:

(a) introducing a ferrite-resin composition comprising ferrite powder and a solid resin material bonding agent for said powder into a closable kneading apparatus equipped with a stirring blade member, the amount of said ferrite-resin composition being less than 90% of the available interior volume of said kneading apparatus,

(b) closing said kneading apparatus,

(c) mixing the components of said ferrite-resin composition by rotating said stirring blade member at a sufficiently high speed to raise the temperature within said kneading apparatus selectively above the melting of softening point of said resin material, to form a uniform dispersion of the components of said ferrite-resin composition,

(d) transferring said uniform dispersion, at a temperature no higher than a temperature 10° C. higher than said melting or softening point of said resin material, to a tank, and



(e) subjecting said uniform dispersion to cooling, stirring and crushing in said tank, to form granules of said uniform dispersion.

4,376,727

METHOD OF SEPARATING GLOBIN

Yasushi Sato, and Shigeru Hayakawa, both of Nagoya, Japan, assignors to The Food Science Institute Foundation, Higashimurayama, Japan

Filed Jan. 13, 1981, Ser. No. 225,182

Claims priority, application Japan, Jan. 29, 1980, 55-008261

Int. Cl.³ A23J *1/06;* **C07C** *103/52*

U.S. Cl. 260—112 B **1 Claim**

1. A method of separating globin comprising separating hemoglobin from blood of an edible animal, forming an aqueous solution containing 0.5 to 5% of hemoglobin, adding an acid to the aqueous solution to adjust the pH value to 2.0 and 2.2 and the ionic strength to 0.005 to 0.015, bring the aqueous solution into contact with carboxymethyl cellulose equilibriated with an acidic liquid having a pH value of 2.0 to 2.2 and an ionic strength of 0.005 to 0.015 and then dissolving out globin from the carboxymethyl cellulose with an acidic liquid.

4,376,728

PROCESS FOR THE PREPARATION OF CATIONIC ALKYLARYLHYDRAZONE DYESTUFFS AND COLOR BASES THEREOF

Roderich Raue, and Hans-Peter Kühlthau, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

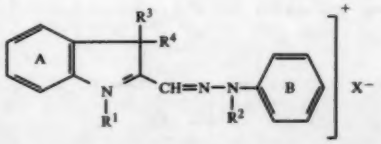
Filed Jun. 8, 1981, Ser. No. 271,164

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023854

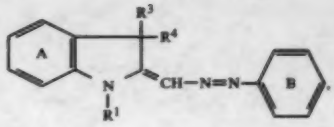
Int. Cl.³ C07D *27/38;* **C09B** *23/16*

U.S. Cl. 260—165 **10 Claims**

1. Process for the preparation of dyestuffs of the general formula



or colour bases of the general formula

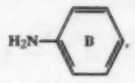


wherein

R^1 and R^2 denote hydrogen, alkyl, alkenyl or aralkyl,

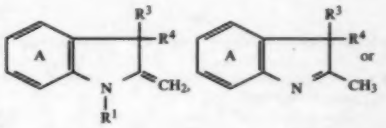
R^3 and R^4 denote methyl or ethyl and

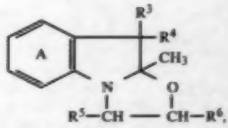
$\overline{X}$ denotes an anion, and wherein the rings A and B and the radicals R^1 and R^2 can carry non-ionic substituents and the rings A and B can carry further fused-on rings, characterised in that an amine of the formula



wherein

B has the abovementioned meaning, and a compound of the formula





wherein

R^1, R^3, R^4 and A have the abovementioned meanings and

R^5 and R^6 represent hydrogen, alkyl, alkoxy, phenoxy or phenyl, are reacted, in the presence of an acid, with a substance which releases nitrous acid and, if appropriate, the product is then reacted with a compound which forms the radicals $R^{1'}$ and/or $R^{2'}$, which represent alkyl, alkenyl or aralkyl which are optionally substituted by non-ionic radicals, and $\overline{X}$.

4,376,729

NOVEL MONOAZO AND DISAZO COLORANTS

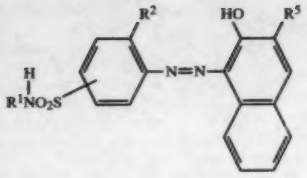
Nathan N. Crounse, Myrtle Beach, S.C., assignor to Sterling Drug Inc., New York, N.Y.

Filed Oct. 8, 1980, Ser. No. 195,128

Int. Cl.³ C09B *29/20, 29/03, 29/15, 26/036*

U.S. Cl. 260—197 **8 Claims**

1. A (N-substituted sulfonamido) monoazo compound having the formula

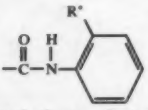


in which

R^1 represents alkylene-NH-alkylene-NH_2 in which alkylene represents $—CH_2CH_2—$ and $—CH_2CH_2CH_2—$;

R^2 represents hydrogen, C_1 to C_3 aikyl or C_1 to C_3 alkoxy;

R^5 represents hydrogen, or



in which R^o represents hydrogen, C_1 to C_3 alkyl or C_1 to C_3 alkoxy; or

the acid-addition salt forms of said monoazo compounds.

4,376,730

PREPARATION OF P-AMINOAZO-BENZENE FROM ANILINE

Johannes de Graaf, Boekelo, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Mar. 13, 1981, Ser. No. 243,573

Int. Cl.³ C07C *107/06, 115/00;* **C09B** *27/00*

U.S. Cl. 260—205 **2 Claims**

1. In a process for the preparation of p-aminoazobenzene which comprises the steps of reacting an excess of aniline with an alkali metal nitrite in a hydrochloric acid medium at a temperature below 100° C., isomerizing the resulting diazoamino compound in the same medium, neutralizing the reaction mixture, and separating the resulting aqueous phase from the organic phase which contains the formed p-aminoazobenzene dissolved in aniline, the improvement comprising effecting the aforesaid reaction in the presence of a compound selected from the group consisting of acrylonitrile, methacrylonitrile, methacrylic acid, alkyl methacrylate with 1 to 4 carbon atoms in the alkyl radical, and butadiene, in an amount of at least about 0.1% but not more than 20% by weight, based on the aniline.

4,376,731

1-AZIRIDINE CARBOXYLIC ACID DERIVATIVES WITH IMMUNOSTIMULANT ACTIVITY

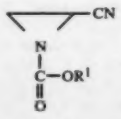
Elmar Bosies, Heppenheim; Ruth Heerdt, Mannheim-Feudenheim; Rudi Gall, Hirschberg-Grosssachsen; Uwe Bicker, Mannheim, and Anna E. Ziegler, Mannheim-Wallstadt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jan. 31, 1978, Ser. No. 859,633

Int. Cl.³ C07D *203/20, 403/12, 405/12;* **A61K** *31/395*

U.S. Cl. 260—239 E **8 Claims**

1. A 1-aziridine-carboxylic acid ester compound of the formula



wherein

R^1 is methyl; propyl; butyl; amyl; a C_{2-5} unsaturated aliphatic hydrocarbon radical; a C_{1-5} aliphatic hydrocarbon radical substituted up to three times by chlorine, bromine, fluorine, C_{1-5} alkoxy, amino, carbamolyoxy, C_{3-10} cycloalkyl, hydroxyl, a phthalimido radical, or a tetrahydrofuryl or tetrahydrothienyl radical, cycloalkyl; or phenyl, naphthyl, benzyl, phenethyl, phenoxyethyl or phenylthioethyl wherein the phenyl or naphthyl moiety is optionally substituted up to 3 times by chlorine, bromine, fluorine, C_{1-5} alkyl, C_{1-5} alkoxy, hydroxyl, amino, nitro, cyano, formyl, acetyl, carbo C_{1-5} alkoxy, $-SCH_3$, phenyl or trifluoromethyl.

4,376,732

NIOBIUM OR TANTALUM CATALYSTS FOR THE PREPARATION OF ETHYLENIMINE

Enrique G. Ramirez, Lake Jackson, Tex., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 167,881, Jul. 14, 1980, Pat. No. 4,337,175. This application Jul. 9, 1981, Ser. No. 281,611

Int. Cl.³ C07D *20/302, 241/12;* **C07B** *3/00, 5/02*

U.S. Cl. 260—239 E **4 Claims**

1. An improved process for dehydrating ethanolamine in the vapor phase to produce ethylenimine which comprises employing a supported catalyst of niobium or tantalum oxide together with an alkaline earth oxide promoter.

4,376,733

PREPARATION OF OXACYCLOALKENONES

Aryeh Frimer, 37 Hanasi Harishon St., Rehovot, Israel

Filed May 11, 1981, Ser. No. 262,506

Claims priority, application Israel, May 20, 1980, 60122

Int. Cl.³ C07D *313/06*

U.S. Cl. 549—268 **19 Claims**

1. A process for the production of 1-hydroxy-2-oxa-3-oxo-Δ^4 steroid which comprises contacting a 3-oxo-Δ^4 steroid with a base in the presence of a dioxygen source in a suitable solvent and isolating the desired product.

4,376,734

PROCESS FOR 3-AMINO-STEROID PREPARATION

Vesperto Torelli, Maisons Alfort, and Lucien Nedelec, Le Raincy, both of France, assignors to Roussel Uclaf, Paris, France

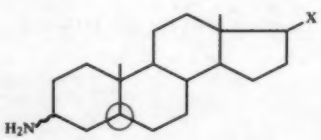
Filed Nov. 10, 1981, Ser. No. 319,912

Claims priority, application France, Nov. 21, 1980, 80 24748

Int. Cl.³ C07J *5/00, 7/00*

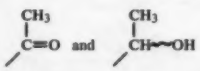
U.S. Cl. 260—397.3 **7 Claims**

1. A process for the preparation of 3-amino-steroids of the formula



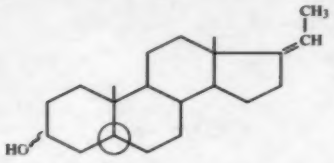
I

wherein X is selected from the group consisting of



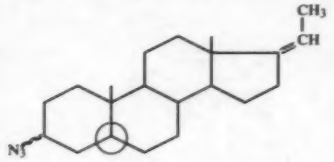
and the wavy lines indicate that the substituents may be in the α- or β-position and their non-toxic, pharmaceutically accept-

able acid addition salts comprising transforming a compound of the formula



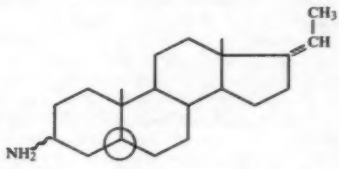
II

wherein the wavy line has the above definition into the corresponding azide of the formula



III

wherein the 3-azide group is inverted to the position of 3-hydroxyl group of formula II, reducing the latter to the 3-amino compound of the formula with the same configuration



IV

subjecting the latter to hydration to obtain the corresponding compound of formula I wherein X is

which may be isolated and salified if desired, and optionally reacting the latter with an oxidation agent to obtain the corresponding compound of formula I wherein X is

which may be isolated and salified, if desired.

4,376,735

N-(SULPHENAMIDO)-ACYL ISOCYANATES

Engelbert Kühle, Bergisch-Gladbach, and Hermann Hagemann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

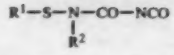
Filed Dec. 11, 1981, Ser. No. 329,961

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049448

Int. Cl.³ C07C *145/02, 161/00*

U.S. Cl. 260—453 RW **12 Claims**

1. An N-(sulphenamido)-acyl isocyanate of the formula



in which

R^1 represents a trihalogenomethyl radical and

R^2 represents an aliphatic, cycloaliphatic, araliphatic, aromatic, furyl or pyridyl radical.

4,376,736

RATE AND YIELD ENHANCEMENT IN THE PREPARATION OF ETHOXYLATED QUATERNARY AMMONIUM BORATES USING ETHYLENE GLYCOL

Keith D. Stanley, Downers Grove, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Sep. 28, 1981, Ser. No. 305,874

Int. Cl.³ C07F *5/04*

U.S. Cl. 260—462 R **42 Claims**

1. A method of producing an ethoxylated quaternary ammonium borate from an amine, diamine or ether amine, ethylene oxide, and boric acid, the improvement comprising adding a diol to said boric acid to form a borate ester chelate complex.

4,376,737

PROCESS FOR THE PRODUCTION OF NAPHTHYLAMINEHYDROXYSULPHONIC ACIDS

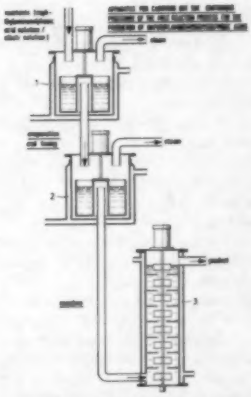
Hans Breitschmid, Pratteln, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 888,711, Mar. 20, 1978, abandoned. This application Jun. 25, 1979, Ser. No. 51,659

Claims priority, application Switzerland, Mar. 31, 1977, 4067/77

Int. Cl.³ C07C *143/66*

U.S. Cl. 260—509 **7 Claims**



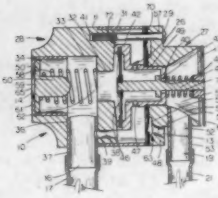
1. A process for the production of naphthylaminehydroxysulphonic acids which essentially comprises simultaneously combining naphthylaminesulphonic acids containing at least two sulphonic acid groups, or the alkali metal salts thereof, and alkali lyes in the form of highly concentrated aqueous solutions at temperatures between 180° and 240° C. and allowing the resulting reaction mixture to react to completion under atmospheric pressure, such that the time required for the metered addition of the components is not more than twice as long as the subsequent reaction time which is necessary under the chosen reaction conditions, while the water content of the reaction melt is between 0.5 and 20%, based on the total melt.

4,376,738

CARBURETION CONTROL APPARATUS

A. I. Reinmuth, 1022 N. 32nd St., Omaha, Nebr. 68131

Filed Sep. 11, 1981, Ser. No. 301,153
Int. Cl.³ F02M 23/08
U.S. Cl. 261—63 6 Claims



1. A carburetion control apparatus for an internal combustion engine having a conventional carburetor with a float chamber in which the level of the fuel is controlled to determine the rate of flow through an orifice into the intake manifold of the engine, the improvement comprising:

a compound valve housing;

means for forming an atmospheric pressure chamber within said housing having an inlet port opening to atmosphere, and an inlet-outlet port connected by tubing to the float chamber above the fuel level;

means for forming a low pressure chamber within said housing having a limiter valve means within an inlet port opening to atmosphere, said limiter valve biased against atmospheric pressure a predetermined amount, and an outlet port connected by tubing to the intake manifold;

means for forming an air bleed chamber within said housing, said air bleed chamber interconnecting said atmospheric pressure chamber and said low pressure chamber, and having an air bleed inlet port opening to atmosphere;

means for supporting a diaphragm within said air bleed chamber, the low pressure side of the diaphragm facing said low pressure chamber and its high pressure side facing said atmospheric pressure chamber, said diaphragm supporting means having at least one aperture therein connecting the high pressure side of the diaphragm with said air bleed chamber;

means for forming a bore within said housing connecting said low pressure chamber and the high pressure side of the diaphragm through said air bleed chamber and said at least one aperture;

means for linking the diaphragm to a means for capping the atmospheric pressure chamber inlet, said capping means having means for biasing it away from said inlet and said linking means having mounted thereon a means for capping the interconnection between said atmospheric pressure chamber and said air bleed chamber; and

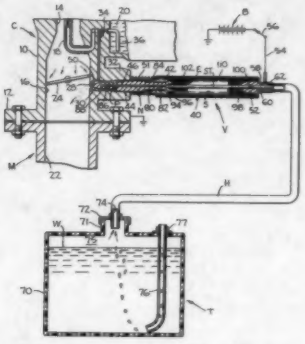
an on-off valve mounted within the tubing to the intake manifold, said on-off valve opening only when the manifold pressure is a predetermined amount less than that at the low pressure chamber outlet port, whereby the diaphragm will simultaneously uncap the interconnection between the atmospheric pressure chamber and the air bleed chamber and cap the atmospheric pressure chamber inlet when pressure at the low pressure chamber outlet port is less than that at the low pressure chamber inlet port by a pre-determined amount thus reducing pressure in the fuel chamber and increasing air flow to the intake manifold.

4,376,739

HEATED AIR BLEED IDLE NEEDLE

John R. Passey, Jr., 425 Hecker Pass Rd., Watsonville, Calif. 95076

Filed Feb. 4, 1982, Ser. No. 345,561
Int. Cl.³ F02M 15/04
U.S. Cl. 261—142 11 Claims



1. An adjustable idle needle valve assembly for controlling the aspiration of idling fuel into the throat of an internal combustion engine carburetor at a zone downstream of the throttle valve, said assembly comprising a threaded metal needle valve, an elongate tubular metal housing, inner metallic plug means for said tubular housing connected to the outer end of said needle valve, outer metallic plug means for said housing, means for insulating one of said plug means from the housing, a tubular electric insulating sleeve within said housing, a helical heating coil of resistance wire within said insulating sleeve connected between said outer and inner plug means, and means for providing an electrical connection to said outer plug means for energizing said coil; the improvement wherein said needle valve has an air bleed passage extending axially from its outer end to a transverse passage at its inner end, an axial air passage in said inner plug means communicating with said needle valve passage, an air inlet passage in said outer plug means, an air conducting shield tube extending between said outer and inner plug means and communicating with the air passages therein, said coil of resistance wire providing the sole electrical connection between said outer and inner plug means, and an air line connection on said outer plug means for selectively connecting said plug means to an air inlet vapor trap.

4,376,740

PROCESS FOR PRODUCTION FINE METAL PARTICLES

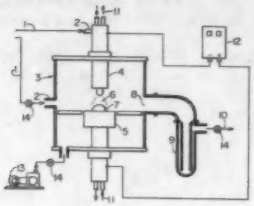
Masahiro Uda, Tokyo; Satoru Ohno, Kiyose, and Tsutomu Hoshi, Kodaira, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Jan. 5, 1981, Ser. No. 222,903
Int. Cl.³ B01J 2/04
U.S. Cl. 264—10 4 Claims

1. A process for producing solid particles of a metal or alloy, comprising:

a. directing a stream of activated hydrogen gas or a mixture of at least 20 percent by volume of activated hydrogen gas and up to 80 percent by volume of at least one gas selected

from the group consisting of argon and helium, onto a mass of molten metal or alloy to subdivide said mass into



particles of said metal or alloy having a diameter of less than 5 microns, and

b. cooling and collecting said particles.

4,376,741

METHOD AND APPARATUS FOR CONTINUOUSLY EXTRUDING AN EXPANDABLE THERMOPLASTIC RESIN COMPOSITION ONTO AN ELONGATED PREFORM

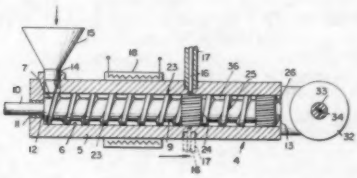
Hans-Dieter Stenzel, Hanover, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette AG, Hanover, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,538

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1979, 2910965

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—45.9 **8 Claims**



1. Method for extruding a thermoplastic composition onto an elongated article to provide a layer of foamed thermoplastic composition thereon, comprising the steps of

feeding the composition into an input end of an extruder housing containing a conveyor screw,

adding nucleating agents to the thermoplastic composition before such composition is fed into said input end of said extruder housing,

conveying said composition along a conveyor screw and simultaneously compressing and heating said composition,

providing while not compressing the composition a pressure retention chamber along a portion of the conveyor screw having a higher pressure than at other portions along the screw and maintaining the higher pressure substantially without pressure drop in said pressure retention chamber,

injecting an inert gas at the higher pressure into said pressure retention chamber,

extruding the resultant mixture about the elongated article.

4,376,742

FUGITIVE LIQUID PHASE DENSIFICATION OF SILICON NITRIDE

Tai-Il Mah, Dayton, Ohio, assignor to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Feb. 23, 1981, Ser. No. 237,227

Int. Cl.³ C04B *35/58*

U.S. Cl. 264—85 **5 Claims**

1. In a method of fabricating a silicon nitride body including the steps of mixing silicon nitride powder with from 1.0 to 2.5% by weight cerium oxide powder and compressing the mixture in an inert atmosphere at a pressure of from 4000–7000 psi and at a temperature of from 1650°–1800° C. for a time sufficient to produce a body having a density substantially equal to the theoretical density of silicon nitride, the improvement comprising:

further treating said silicon nitride body at a temperature of from 1400°–1600° C. for from 4–48 hours in an inert atmosphere to improve slow crack growth resistance.

4,376,743

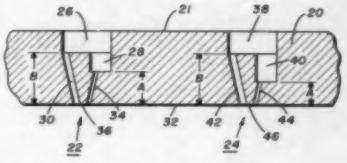
MELT SPINNING PROCESS

John R. Dees, Pensacola, Fla., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Jun. 12, 1981, Ser. No. 273,135

Int. Cl.³ D02G *1/20*

U.S. Cl. 264—103 **6 Claims**



1. In a spinneret comprising a plurality of combined orifices having corresponding parts in corresponding arrangement, said parts and arrangement including two or more individual capillaries disposed in angular relationship, separated by a land and arranged to spin a variable denier filament, the improvement comprising, said combined orifices having different nominal dimensions such that either,

a. corresponding capillary lengths differ by at least 0.0007 inch;

b. corresponding capillary transverse dimensions differ by at least 0.0002 inch;

c. the included angles between the corresponding capillaries differ by at least 1 degree; or

d. the land widths between corresponding capillaries differ by at least 0.0006 inch,

said different nominal dimensions of said combined orifices being selected to reduce doff to doff property variations of yarns spun from said spinneret.

4,376,744

MECHANICAL AND FLUID ACTUATED RAM FOR POWDER COMPACTING PRESS AND METHOD OF COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

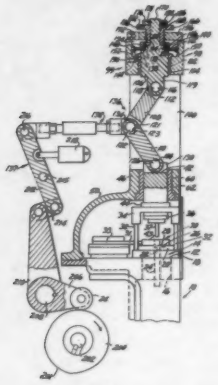
Continuation-in-part of Ser. No. 183,011, Sep. 2, 1980, Pat. No. 4,302,412, which is a continuation of Ser. No. 14,311, Feb. 23, 1979, abandoned, which is a division of Ser. No. 798,823, May 20, 1977, Pat. No. 4,166,716. This application Nov. 23, 1981, Ser. No. 323,725

Int. Cl.³ B30B *11/02*

U.S. Cl. 264—106 **6 Claims**

1. A powder compacting press comprising a table, a ram reciprocably movable relative to said table, first means for reciprocating said ram comprising a first connecting rod having an end pivotably attached to an end of said ram, a second connecting rod having an end pivotably attached to the other end of said first connecting rod and another end pivotably attached to a slide member and a push-pull rod pivotably attached at one end to said pivotable connection between said first and second connecting rods for displacing said pivotable

connection to a position laterally moving said pivotable connection for displacing said ram away from said table to a position displacing said ram towards said table, a fluid cylinder having a movable member, said movable member being attached to said slide member, a pressurized fluid in said cylinder for displacing said movable member and said slide member in a first direction toward said table, first abutment means adjustably defining the extreme position of displacement of said slide member in said first direction, second abutment means adjustably defining the extreme position of motion of said slide member in an opposite direction, a rotating cam operating said push-pull rod, said cam having a lobe contour causing displacement of said ram to a predetermined position most proximate to said table with the pressure in said cylinder counterbalancing a force exerted on said ram in an opposite direction and for abruptly increasing the force exerted on said ram in response to increase of said force in an opposite direction, whereby said second abutment means engage each other.



4,376,745

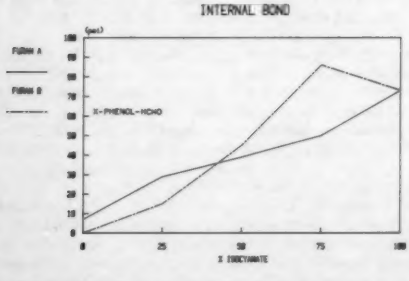
PARTICLE BOARD PROCESS USING FURAN RESIN/ISOCYANATE BINDER

William E. Johns, Pullman, Wash., assignor to Washington State University Research Foundation, Pullman, Wash.

Filed Jun. 15, 1981, Ser. No. 273,512

Int. Cl.³ B29J 5/00

U.S. Cl. 264—109 **3 Claims**



1. A process for the preparation of a particle board comprising the steps of blending a polyisocyanate with a furan resin to form a binder, mixing said binder with wood chip particles and molding said mixture of binder and cellulosic material under heat to form said particle board.

4,376,746

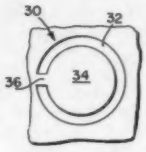
FORMATION OF HOLLOW TAPERED BRUSH BRISTLES

John Ward, Crofton; Robert Austin, Crownsville, and Anthony Genovese, Baltimore, all of Md., assignors to Ametek, Inc., Odenton, Md.

Division of Ser. No. 136,580, Apr. 1, 1980, Pat. No. 4,307,478. This application Sep. 17, 1981, Ser. No. 303,324

Int. Cl.³ D01D 5/20

U.S. Cl. 264—167 **9 Claims**



1. A spinnerette for the manufacture of hollow, tapered bristles, comprising a plurality of slot apertures, each said slot aperture forming an almost complete circle and having located therein a solid interior portion supported by a single pin which interrupts the slot orifice and prevents said slot orifice from forming a complete circle, each said pin having a width of approximately 4.5–6 mils, the width of each said slot being 5.6–7 mils, the outer diameter of each said orifice being 23–70 mils, and the land length of each said orifice being 23–38 mils.

4,376,747

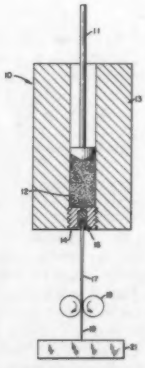
PROCESS FOR CONTROLLING THE CROSS-SECTIONAL STRUCTURE OF MESOPHASE PITCH DERIVED FIBERS

Faramarz Nazem, Strongsville, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 11, 1980, Ser. No. 215,412

Int. Cl.³ D01D 1/04

U.S. Cl. 264—176 F **16 Claims**



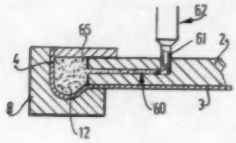
1. In the process of producing a continuous carbon fiber from mesophase pitch, including the steps of spinning a pitch fiber having a diameter of less than about 60 microns from the mesophase pitch by passing the mesophase pitch through a spinnerette channel defined between the inside and outside surfaces of a spinnerette, thermosetting the pitch fiber, and thereafter, carbonizing the pitch fiber to produce the carbon fiber, the improvement comprises positioning a porous body in the spinnerette channel.

4,376,748

METHOD AND APPARATUS FOR FORMING A PLATE WITH AT LEAST ONE PROFILED BORDER

Waltherus J. van Erven, Grote Voort 6a, 5081 HE Hilvarenbeek, Netherlands

PCT No. PCT/NL80/00036, § 371 Date Jun. 19, 1981, § 102(e) Date Jun. 19, 1981, PCT Pub. No. WO81/01263, PCT Pub. Date May 14, 1981
PCT Filed Nov. 6, 1980, Ser. No. 276,370
Claims priority, application Netherlands, Nov. 7, 1979, 7908139
Int. Cl.³ B29C 17/02; B29G 3/00
U.S. Cl. 264—255 8 Claims



1. A method of forming a slab having at least one profiled edge comprising a base sheet and a cover sheet connected herewith, the cover sheet being partly connected with the base sheet in a manner such that a portion of the cover sheet protrudes beyond the edge of the base sheet, in the proximity of which the profiled edge is to be formed characterized by the following successive steps:

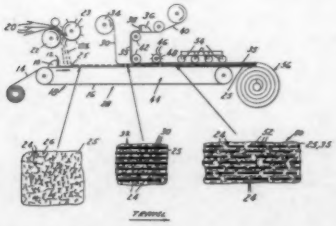
a. positioning the base sheet, with a portion of the cover sheet in direct adhering contact with said base sheet such that a second portion of said sheet protrudes beyond the edge of said base sheet in a mold cavity having a desired configuration for forming said profiled edge and engaging a surface of said cover sheet remote from said base sheet against a mold wall defining said cavity, while deforming the protruding portion of said cover sheet out of its plane;
b. filling out a space bounded by the protruding part of the cover sheet and the edge of the base sheet with curable filling material that adheres to the two sheets,
c. curing of the filling material and
d. removing the slab from the mold.

4,376,749

FIBER-REINFORCED COMPOSITE WHEEL CONSTRUCTION

James A. Woelfel, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 119,141, Feb. 6, 1980, Pat. No. 4,294,490. This application Jun. 26, 1981, Ser. No. 277,814
Int. Cl.³ B29C 3/02; B29G 1/00
U.S. Cl. 264—258 20 Claims



1. A method for making a fiber-reinforced plastic wheel rim comprising the steps of:

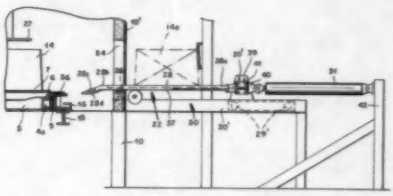
(a) forming a rim mold charge by winding resin-impregnated fiber sheet molding compound to form a hoop having a directional reinforcing fibers all extending generally axially of said hoop,
(b) compression molding said hoop in a mold with heat and pressure, to shape and unite the resin and fibers of said compound into a unitary structure comprising said wheel rim having said directional fibers extending generally parallel to the rim axis, and
(c) curing said resin to complete the rim by maintaining such heat and pressure in said mold at least for a time sufficient to form such unitary rim, and then
(d) removing said unitary rim from the mold.

4,376,750

METHOD FOR SEPARATING AND REMOVING A MOLDED ELEMENT FORMED BY FIRING AND PYROPLASTIC ADHESION OF THE MATERIAL FROM A MOLD

Karl Briem, Wuppertal-Barmen, and Hanno Laurien, Brunswick, both of Fed. Rep. of Germany, assignors to Zytan Thermochemische Verfahrenstechnik GmbH & Co. KG, Brunswick, Fed. Rep. of Germany

Filed Apr. 29, 1980, Ser. No. 144,913
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917646
Int. Cl.³ B28B 13/00; B29C 7/00
U.S. Cl. 264—336 4 Claims



1. A method of separating and removing a molded element, formed by firing and pyroplastic adhesion of the material to be fired, more particularly a clay which is capable of expanding, from the mold surrounding it, the said mold having a base formed by grid bars or otherwise penetrated to allow the material to be fired to be acted upon by hot gases flowing through the material, the said base having a support surface facing the material which is like a bar grid, and having a structure forming the side walls which is preferably separated from the said base, characterized in that the molded body is pressed upwards with plastic deformation and raised from the bars, in the region between its surfaces bearing on the bars or the profiling of the bars of the base, starting from one end of the bars and progressing longitudinally of the bars, thus forming a wedge-shaped and broadening clearance progressing along the surface bearing on the bars.

4,376,751

PRODUCTION OF SUPER-SMOOTH ARTICLES

David V. Duchane, Los Alamos, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 29, 1981, Ser. No. 268,425
Int. Cl.³ B29C 25/00
U.S. Cl. 264—341 12 Claims

1. A method of smoothing the surface of an article comprising a first material selected from the group consisting of poly(methyl methacrylate) and acrylonitrile-butadiene-styrene polymers, said method comprising:

(a) immersing at least a portion of said article into a bath consisting essentially of (1) at least one solvent for said first material and (2) a diluent consisting essentially of at

least one nonsolvent for said first material and optional accessory material which is soluble in said bath; and

(b) slowly removing said solvent from said bath by diluting said bath with said diluent, wherein said nonsolvent is a mixture of water and a water-soluble polymer having a molecular weight within the range from about 2000 to

about 20,000, wherein said at least one solvent is selected from the group consisting of ketones and esters which show some significant mutual solubility with water, and wherein the rate of dilution of said bath is such that it results in extraction of said solvent from said first material on a molecular scale, rather than on a massive scale.

4,376,752

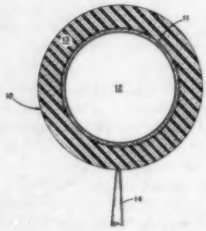
FOAM ENCAPSULATED TARGETS

John H. Nuckolls; Albert R. Thiessen, and Glen H. Dahlbacka, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 2, 1975, Ser. No. 609,639

Int. Cl.³ G21B *1/00*

U.S. Cl. 376—152 **18 Claims**



1. A foam encapsulated target comprising: a hollow substantially spherical shell constructed from a nonexplosive material and containing a quantity of fuel, said shell being encapsulated in nonexplosive foam composed of material having a density in the range of 0.065 to 0.6×10^3 kg/m^3 and a cell size of about 0.3 to 2 μm.

4,376,753

CORROSION PROTECTION SYSTEM FOR NUCLEAR POWER PLANT

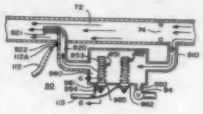
Robert G. Lucas, Stanford, Calif., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Dec. 20, 1979, Ser. No. 105,752

Int. Cl.³ G21C *19/32*

U.S. Cl. 376—305 **9 Claims**

5. In a nuclear power plant having a nuclear reactor; a steam generator comprising a bundle of heat exchanger tubes extending through the interior of said compartment, and support plates extending at intervals across said steam generator with apertures therein receiving said heat exchanger tubes; a pressurized water system for said reactor communicating with said heat exchanger tubes; a fresh water feed system including a main feed pipe for supplying fresh water to the secondary side of said steam generator to be converted into steam; a turbine-generator system receiving said steam for converting heat energy therein into electric power; and a steam condenser system communicating with said turbine-generator system to convert residual steam to water, including a condensate pump for returning said water to said fresh water feed system; a corrosion protection system for inhibiting corrosion in said fresh water feed system and said steam generator to reduce denting of said heat exchanger tubes, said corrosion protection system comprising a source of electrically conductive fluid; at least one ion tank located proximate one section of said main feed pipe and having a first inlet communicating with said main feed pipe to draw fresh feed water into said ion tank, an outlet communicating with said main feed pipe to return treated water thereto, and a second inlet communicating with said



source of electrically conductive fluid; valve means associated with said second inlet for controlling the introduction of metered amounts of said conductive fluid into said ion tank to render the liquid flowing therethrough substantially conductive; at least one ionizable metal anode mounted in said ion tank; and means supplying a positive direct current voltage to said anode and a negative direct current voltage to at least one conductive wall portion of said outlet to produce an electric current through said conductive fluid in said tank, resulting in treated water being returned to said main feed pipe to form a protective coating on interior walls of said main feed pipe, exterior surfaces of said heat exchanger tubes, and surfaces of said support plates for reducing the rate of corrosion product formation on said surfaces.

4,376,754

PYROMETALLURGICAL SMELTING OF LEAD AND COPPER

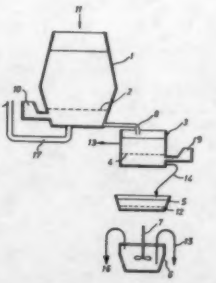
Maurice R. Smith, Fishponds, England, assignor to Metallurgical Processes Limited, Nassau, The Bahamas

Division of Ser. No. 39,761, May 17, 1979, Pat. No. 4,261,743. This application Jun. 17, 1980, Ser. No. 160,329

Claims priority, application United Kingdom, May 31, 1979, 24714/78

Int. Cl.³ C22C *9/08*

U.S. Cl. 420—573 **10 Claims**



1. A method of smelting an oxidic charge containing lead and copper in a blast furnace, comprising diluting molten lead

bullion flowing to the furnace bottom and containing at least 8% by weight of copper with a diluent consisting of metallic lead of lower copper content, said dilution being effected in a forehearth into which furnace products are passed from the furnace.

4,376,755

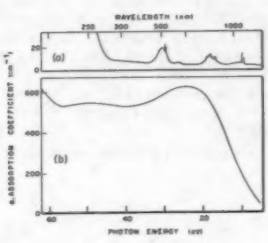
PRODUCTION OF CRYSTALLINE REFRACTORY METAL OXIDES CONTAINING COLLOIDAL METAL PRECIPITATES AND USEFUL AS SOLAR-EFFECTIVE ABSORBERS

Jagdish Narayan, Knoxville, and Yok Chen, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 240,670, Mar. 5, 1981. This application Jan. 29, 1982, Ser. No. 344,085

Int. Cl.³ C01F *1/00, 5/00, 7/00;* **C01G** *53/00*

U.S. Cl. 423—275 **14 Claims**



1. A process for treating a refractory oxide material to increase its room-temperature absorptivity over at least the visible portion of the solar-energy spectrum, said process comprising:

providing said material in the form of a metal-doped crystalline oxide body,

exposing said body to a reducing atmosphere at a superatmospheric pressure and at a temperature effecting precipitation of said metal in the lattice of said body but insufficient to effect net diffusion of said metal out of said lattice, and

cooling said body.

12. A refractory crystalline oxide of at least one metal selected from the group consisting of Mg and Al, said oxide containing colloidal metallic precipitates and having a room-temperature absorptivity exceeding 0.90 for photon wavelengths below about 2 μm.

4,376,756

PROCESS FOR BLENDING PHOSPHORIC ACIDS OF DIFFERING IMPURITY CONTENT

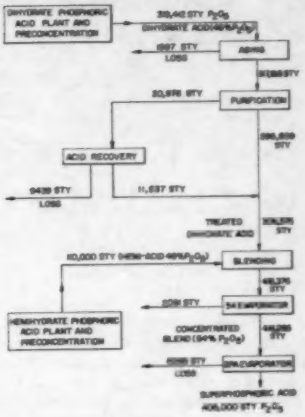
Harold E. Mills; David L. Murdock, both of Lake City; Richard M. Ramer, Gainesville, and Francis M. Sale, Lake City, all of Fla., assignors to Occidental Chemical Company, White Springs, Fla.

Filed Dec. 5, 1980, Ser. No. 215,885

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—317 **21 Claims**

1. Process for producing a blended phosphoric acid having an R-value no greater than about 0.86, where the R-value is one hundred times the ratio of the MgO analysis by weight divided by the P_2O_5 analysis by weight of said acid, said process comprising blending a sufficient amount of at least one purified dihydrate process phosphoric acid having an R-value less than 0.86 with at least one phosphoric acid produced by a hemihydrate process and having an R-value greater than 0.86, to produce a blended phosphoric acid having an R-value no greater than about 0.86; wherein said purified phosphoric acid is purified by aging a dihydrate process phosphoric acid for



sufficient time to allow at least some magnesium-containing solids to precipitate from said acid and separating at least some of said precipitated magnesium containing solids from said phosphoric acid by filtration to produce said purified dihydrate process phosphoric acid having an R-value less than 0.86.

4,376,757

SYNTHETIC CRYSTALLINE SILICATE COMPOSITIONS AND PREPARATION THEREOF

James A. Hinnenkamp, and Vernon V. Walatka, Jr., both of Cincinnati, Ohio, assignors to National Distillers & Chemical Corp., New York, N.Y.

Continuation-in-part of Ser. No. 92,127, Nov. 7, 1979, Pat. No. 4,331,641. This application Apr. 22, 1981, Ser. No. 256,297

Claims priority, application Canada, Oct. 23, 1980, 363052

Int. Cl.³ C01B *33/20, 33/32*

U.S. Cl. 423—332 **8 Claims**

1. A crystalline silicate composition which is substantially free of aluminum having a composition in terms of mole ratios of oxides as follows:

$$(0\text{-}50)\ R_2O:(0\text{-}50)\ \frac{M_{\frac{2}{m}}}{m}O:(0\text{-}30)\ \frac{Z_{\frac{2}{z}}}{z}O:100\ SiO_2:(0\text{-}200)\ H_2O$$

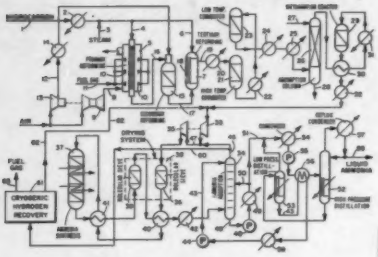
where R is the organic nitrogen-containing cation derived from choline, M is an alkali metal cation, ammonium, hydrogen, a metal cation or mixtures thereof, m is the valence of M,Z is a Group VIII metal cation and z is the valence of said Group VIII metal cation, the composition being characterized by the X-ray diffraction pattern set forth in Table I of the specification.

4,376,758

PROCESS FOR SYNTHESIZING AMMONIA FROM HYDROCARBONS

Giorgio Pagani; Dino Bosco, and Lorenzo Brambilla, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 6, 1981, Ser. No. 222,988
Claims priority, application Italy, Jan. 8, 1980, 19076 A/80
Int. Cl.³ C01C 1/04
U.S. Cl. 423—359 11 Claims



1. An ammonia synthesis process comprising the generation of synthesis gas from hydrocarbons by the primary reforming of said gases with steam and by the secondary reforming of the resulting gaseous mixture with oxygen, characterized in that it comprises the steps of subjecting a part, not passed through the primary reforming, of the starting hydrocarbon mixed with the steam to a tertiary reforming in which the necessary heat is supplied, by means of indirect heat exchange, by the gaseous reaction mixture leaving the secondary reforming; said tertiary reforming being of the mixing type in which the reformed gaseous mixture, which forms by flowing inside pipes containing the catalyst of said tertiary reformer, directly mixes, before said heat exchange occurs, with the gaseous reaction mixture leaving the secondary reforming, such mixture providing, from outside the pipes, the heat necessary for said tertiary reforming; causing the ammonia synthesis to occur at an absolute pressure lower than 100 kg/cm^2 with drying of the gas conveyed to the synthesis reactor by employing molecular sieves; absorbing the ammonia contained in the reacted gas with water; and subjecting the ammonia solution so obtained to distillation to obtain a relatively concentrated ammonia product.

4,376,759

CYCLIC PROCESS FOR MAKING HYDROGEN

Newell C. Cook, 1634 E. Lake Joanna Dr., Eustis, Fla. 32726, and Gary C. Davis, 5 Felicia Ct., Albany, N.Y. 12205

Filed Feb. 10, 1981, Ser. No. 233,177
Int. Cl.³ C01B 1/02
U.S. Cl. 423—648 R 8 Claims

7. The process for the production of hydrogen which comprises the steps of bringing nitric oxide into contact with an anhydrous acid selected from the group consisting of metaphosphoric acid, meta-boric acid, meta-silicic acid, meta-aluminic acid and mixtures thereof at a temperature between 200° and 400° C., reacting the nitric oxide with the said acid, and separating the resulting gaseous hydrogen from the reaction mixture.

4,376,760

TRIDECAPEPTIDE

Günther Jung, Tübingen; Hans Brückner, Ostfildern, both of Fed. Rep. of Germany; Peter Swetly, Vienna, Austria, and Gerhard Bozler, Biberach an der Riss, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung, Biberach an der Riss, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,212
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040825
Int. Cl.³ G01N 33/00; A61K 39/00; C07C 103/52
U.S. Cl. 424—1.5 3 Claims

1. The tridecapeptide of the formula H-Met-Ser-Tyr-Asn-Leu-Leu-Gly-Phe-Leu-Gln-Arg-Ser-Ser-OH.

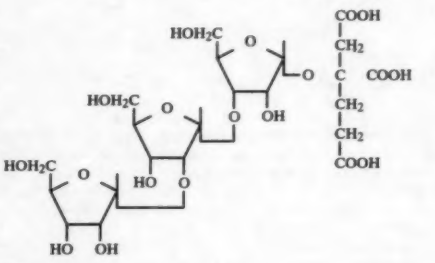
4,376,761

HOMOCITRIC ACID OLIGORIBOSIDE DERIVATIVE FOR PREVENTION OF DENTAL CARIES

Yoshiro Okami, Tokyo; Kazuhiko Yamada, Fujisawa, and Masachika Takashio, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation-in-part of Ser. No. 238,324, Feb. 26, 1981, abandoned. This application Jul. 9, 1981, Ser. No. 281,800
Claims priority, application Japan, Mar. 8, 1980, 55/29690
Int. Cl.³ A61K 9/68, 7/16; C07H 15/04; C12P 19/00
U.S. Cl. 424—48 4 Claims

1. The compound ribocitrin having the formula



I

or a nontoxic salt thereof.

2. An oral composition for caries prophylaxis which comprises a carrier suitable for use in the oral cavity and an effective dextransucrase-inhibiting amount of ribocitrin or a nontoxic salt thereof.

4,376,762

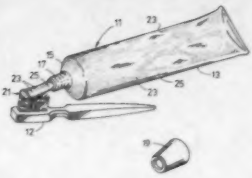
FUNCTIONAL AGGLOMERATED SPECKLES, DENTIFRICES CONTAINING SUCH SPECKLES AND METHODS FOR MANUFACTURING SUCH SPECKLES AND DENTIFRICES CONTAINING THEM

John P. Hauschild, Bridgewater, and Joseph R. Principe, East Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,272
Int. Cl.³ A61K 7/16
U.S. Cl. 424—49 8 Claims

1. A dentifrice comprising water, humectant, gelling agent, detergent and flavor, all of which are constituents of a gelled vehicle of the dentifrice, and a dental polishing agent, uniformly distributed throughout the vehicle, and visible func-

tional speckles distributed through the dentifrice, which are agglomerates of a water insoluble powdered functional material and a combination of a water insoluble, ethanol soluble ethyl cellulose binder and a water soluble binder.

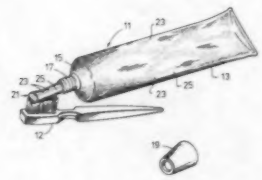


4,376,763

FUNCTIONAL AGGLOMERATED SPECKLES, METHOD FOR MANUFACTURE THEREOF AND DENTIFRICES CONTAINING SUCH SPECKLES

Jordan Barth, East Brunswick, and James Norfleet, Plainfield, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,273
Int. Cl.³ A61K *7/16*
U.S. Cl. 424—49 **7 Claims**



1. A dentifrice comprising water, humectant, gelling agent, detergent and flavor, all of which are constituents of a gelled vehicle of the dentifrice, and a dental polishing agent, uniformly distributed throughout the vehicle, and visible functional speckles distributed through the dentifrice which are agglomerates of a water insoluble powdered functional material and water insoluble, ethanol soluble ethyl cellulose binder.

4,376,764

SILVER ION GEL COMPOSITIONS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 10, 1981, Ser. No. 291,320
Int. Cl.³ A61K *31/74, 31/625, 33/38*
U.S. Cl. 424—78 **8 Claims**

1. A silver ion gel composition which remains a gel at temperatures below room temperature comprising an amount of water-soluble or water-insoluble silver salt effective to treat a burn wound, about 85 to about 65 percent by weight water and about 15 to about 35 percent by weight of a polyoxybutylene-polyoxyethylene block copolymer, said block copolymer being a cogeneric mixture of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms; the compounds being characterized in that all of the oxybutylene groups are present in polyoxybutylene chains that are attached to the organic radical at the site of a reactive hydrogen atom thereby constituting a polyoxybutylene polymer; the oxyethylene groups being attached to the oxybutylene polymer in polyoxyethylene chains; the average molecular weight of the polyoxybutylene polymers in the mixture being at least 1200, as determined by hydroxyl number, and the oxyethylene groups present constituting 50 to 80 percent, by weight, of the mixture, with the provisos that

(a) when the oxybutylene polymer molecular weight is about 1200, then the minimum polyoxyethylene content is about 60 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 25 percent by weight of the aqueous gel composition;

(b) when the oxybutylene polymer molecular weight is about 1800, then the minimum polyoxyethylene content is about 55 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 20 percent by weight of the aqueous gel compositions;

(c) when the oxybutylene polymer molecular weight is about 2400, then the minimum polyoxyethylene content is about 50 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 16 percent by weight of the aqueous gel composition;

(d) when the oxybutylene polymer molecular weight is about 3000, then the minimum polyoxyethylene content is about 45 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 16 percent by weight of the aqueous gel composition.

4,376,765

MEDICAMENTS, THEIR PREPARATION AND COMPOSITIONS CONTAINING SAME

Andre B. L. Trouet, Winksele; Michele M. L. G. Masquelier, Brussels, and Roger M. Baurain, Wezembeek, all of Belgium, assignors to Institut International de Pathologie Cellulaire et Moleculaire, Brussels, Belgium

Filed Mar. 31, 1981, Ser. No. 249,487
Claims priority, application Belgium, Mar. 31, 1980, 882541
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **13 Claims**

1. A medicament compound of the formula

Carrier-spacer arm-Drug

wherein

"drug" represents the therepeutically active principle containing a free amino function, said drug being selected from the group consisting of antitumoral anthracyclines, antimalarial and antileishmanial quinoleines,

"spacer arm" is a chain of peptidic nature represented by the sequence

X—L—Leu

wherein L—Leu represents a L—leucyl moiety bound through its carboxylic amino function to the amino function of the drug and X represents 1, 2 or 3 aminoacids which may be identical or different, selected from the group consisting of L-alanine, glycine and L—leucine and having a possible succinylated terminal amino function, and —"carrier" is a macromolecule of proteinic nature, the nature of which is related to the transport and/or affinity of action intended for the drug, said carrier being selected from the group consisting of bovine serum albumin, fetuine, immuno-globuline, asiafetuine or peptidic hormones.

4,376,766

ANTI-SICKLING AGENTS

Rosalind I. Collinson-Jones, Jordans, and John F. Pardon, High Wycombe, both of England, assignors to G.D. Searle & Co., Skokie, Ill.

Filed Jul. 24, 1981, Ser. No. 286,416

Claims priority, application United Kingdom, Aug. 1, 1980, 8025178

Int. Cl.³ A61K *37/02;* **C07C** *103/52*

U.S. Cl. 424—177 **11 Claims**

1. A pharmaceutical composition of use in the treatment of sickle cell disease comprising, as active ingredient, an anti-sickling amount of a compound selected from the group consisting of L-lysine-L-phenylalanine, L-lysine-L-tyrosine and pharmaceutically-acceptable salts thereof in association with a pharmaceutically-acceptable carrier or diluent.

4,376,767

PYRIDYLMETHYL ESTERS OF SELECTED BIO-AFFECTING CARBOXYLIC ACIDS

Kenneth B. Sloan, Gainesville, Fla., assignor to Merck & Co., Inc., Rahway, N.J.

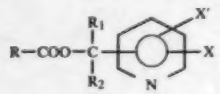
Filed Jan. 2, 1981, Ser. No. 222,030

Int. Cl.³ A61K *31/625;* **C07D** *499/32, 501/38, 213/55*

U.S. Cl. 424—232 **129 Claims**

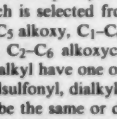
1. A compound selected from the group consisting of:

(a) compounds having the structural formula



(I)

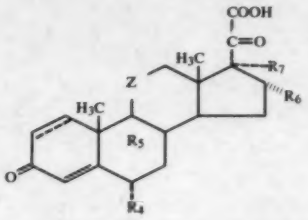
wherein R_1 and R_2, which can be the same or different, are each hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, C_1–C_5 alkylthio, phenyl, or substituted phenyl having one or more substituents each of which is selected from the group consisting of C_1–C_5 alkyl, C_1–C_5 alkoxy, chloro and dialkylamino wherein the alkyl portions, which can be the same or different, each have 1 to 5 carbon atoms, with the proviso that when R_1 is alkoxy or alkylthio, then R_2 cannot be alkoxy or alkylthio; X and X′, which can be the same or different, are each hydrogen, C_1–C_5 alkyl, carboxy, C_2–C_6 alkoxycarbonyl, halo, C_1–C_5 alkoxy, dialkylcarbamyl wherein the alkyl portions, which can be the same or different, each have 1 to 5 carbon atoms, phenyl, or substituted phenyl having one or more substituents each of which is selected from the group consisting of C_1–C_5 alkyl, C_1–C_5 alkoxy, C_1–C_6 alkanoyl, C_1–C_6 alkanoyloxy, halo, cyano, C_2–C_6 alkoxycarbonyl, C_1–C_5 alkylthio, nitro, C_1–C_5 haloalkyl have one or more halo substituents, carboxy, C_1–C_5 alkylsulfonyl, dialkylamino wherein the alkyl portions, which can be the same or different, each have 1 to 5 carbon atoms, and dialkylcarbamyl wherein the alkyl portions, which can be the same or different, each have 1 to 5 carbon atoms; the pyridyl ring is oriented such that it is attached to the



portion of the molecule via a carbon-carbon bond; and R—COO— is the acyloxy residue of:

(1) a monocarboxylic acid selected from the group consisting of indomethacin, aspirin, naproxen, sulindac, tolmetin, diflunisal, flurbiprofen, indoprofen, fenclozic acid, ketoprofen, alclofenac, bucloxic acid, cinchophen, pirprofen, fluprofen, flutiazin, clometacin, flufenisal, salsalate, ibuprofen, ibufenac, cinmetacin, furobufen and prodolic acid;

(2) a steroidal monocarboxylic acid having the structural formula



(III)

wherein R_4 is hydrogen, fluoro, chloro, or methyl; R_5 is hydrogen, fluoro or chloro; R_6 is hydrogen, methyl, hydroxy or —$OCOR_8$ wherein R_8 is C_1–C_7 straight or branched alkyl or phenyl; R_7 is hydrogen, hydroxy, or —$OCOR_8$ wherein R_8 is as defined above, with the proviso that when R_6 is hydroxy or —$OCOR_8$ and R_7 is other than hydrogen, then R_6 and R_7 are identical; or R_6 and R_7 are combined to form a divalent radical of the type

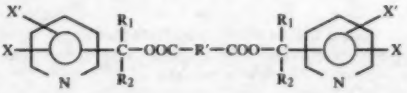
wherein R_9 and R_{10}, which can be the same or different, are each C_1–C_7 straight or branched alkyl or phenyl; Z is carbonyl or β-hydroxymethylene; the wavy line at the 16-position indicates the α or β-configuration; and the dotted line in ring A indicates that the 1,2-linkage is saturated or unsaturated;

(3) a cephalosporin antibiotic having one carboxylic acid function;

(4) a penicillin antibiotic having one carboxylic acid function; or

(5) a monocarboxylic acid selected from the group consisting of γ-aminobutyric acid, captopril and valproic acid;

(b) compounds having the structural formula



(II)

wherein the groups attached to each end of the divalent —OOC—R′—COO— residue are identical to each other; R_1, R_2, X, X′ and the orientation of the pyridyl ring are as defined with respect to formula (I) above; and —OOC—R′—COO— is the di(acyloxy) residue of:

(1) a cephalosporin antibiotic having two carboxylic acid functions;

(2) a penicillin antibiotic having two carboxylic acid functions; or

(3) the dicarboxylic acid, methotrexate; and

(c) the non-toxic pharmaceutically acceptable acid addition salts, quaternary ammonium salts, and N-oxides of the compounds of formulas (I) and (II) above.

34. A compound as defined by claim 1, wherein R—COO— is the acyloxy residue of a monocarboxylic acid selected from the group consisting of indomethacin, aspirin, naproxen, sulindac, ibuprofen, tolmetin, diflunisal, flurbiprofen, indoprofen, fenclozic acid, ketoprofen, alclofenac, bucloxic acid, cinchophen, cinmetacin, ibufenac, furoburen, prodolic acid, pirprofen, fluprofen, flutiazin, clometacin, flufenisal and salsalate.

110. A pharmaceutical composition of matter comprising an anti-inflammatory, analgesic, or antipyretic effective amount of a compound as defined by claim **34**, and a pharmaceutically acceptable carrier therefor.

4,376,768

BENZOTHIAZINE DERIVATIVE

Shoichiro Ozaki; Hideya Kobayashi, both of Kamakura; Haruki Mori, Yokohama; Takafumi Kitano, Mobara; Hiroshi Kawazura, Mobara, and Yutaka Okazaki, Mobara, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,229
Claims priority, application Japan, Jun. 27, 1980, 55-86455
Int. Cl.³ C07D *417/12*; A61K *31/54*
U.S. Cl. 424—246 **2 Claims**

1. N-(6-chloro-2-pyridyl)-3,4-dihydro-2-methyl-4-oxo-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide.

2. An anti-inflammatory composition comprising N-(6-chloro-2-pyridyl)-3,4-dihydro-2-methyl-4-oxo-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide and a pharmaceutical carrier.

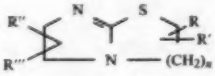
4,376,769

SUBSTITUTED IMIDAZO THIAZOLES THIAZINES, THIAZEPINES AND THIAZOCINES

Sherlock Margaret H., Bloomfield, assignor to Schering Corporation, Kenilworth, N.J.

Filed Jun. 19, 1981, Ser. No. 275,166
Int. Cl.³ A61K *31/425, 31/54*; C07D *513/04*
U.S. Cl. 424—246 **15 Claims**

1. Compounds of the formula



and the non-toxic therapeutically effective acid addition and quatenary salts thereof wherein R and R′ are independently hydrogen and lower alkyl; R″ and R‴ independently are members of the group consisting of hydrogen, lower alkyl, aryl, aralkyl, pyridyl, furyl, thienyl, benzhydryl, naphthyl, indolyl, biphenyl and indenyl, including X and/or Y substituted aryl, aralkyl, pyridyl, furyl, thienyl, benzhydryl, naphthyl, indolyl, biphenyl and indenyl wherein X and Y are members of the group consisting of halogen, hydroxy, nitro, amino, lower alkyl, lower alkoxy, trifluoromethyl, imidazolyl, trifluoromethylthio, lower alkylthio, lower alkyl sulfinyl and lower alkyl sulfonyl; n is an integer of 1 to 4; with the proviso that when n is 1 R″ and R‴ are not hydrogen or lower alkyl and when n=2 at least one of R″ and R‴ cannot be hydrogen; and with the further proviso that when n is 1, R″ and R‴ are not both phenyl at the 6-position of the imidazoline moiety.

14. The method of eliciting an anti-inflammatory response from a mammal suffering with an inflammatory condition which comprises administering to the mammal an anti-inflammatory quantity of a compound of the formula of claim **1**.

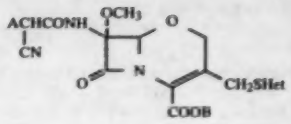
4,376,770

CEPHALOSPORIN ANALOGS FOR ORAL USE

Masayuki Narisada, Ibaraki; Tetso Okada, Sakai; Tadashi Yoshida, Osaka, and Shinzo Matsuura, Itami, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jul. 23, 1981, Ser. No. 285,876
Claims priority, application Japan, Jul. 23, 1980, 55-101779
Int. Cl.³ A61K *31/535*; C07D *498/04*
U.S. Cl. 424—248.51 **20 Claims**

1. A 7β-(2-cyanoaliphatic acyl)amino-7α-methoxy-3-heterocyclic thiomethyl-1-dethia-1-oxa-3-cephem-4-carboxylic acid compound represented by the following formula:



wherein

A is C_1 to C_8 alkyl, C_2 to C_8 alkenyl or C_2 to C_8 alkynyl;

B is (1) a hydrogen atom, (2) a salt forming light metal atom selected from the group of lithium, sodium, potassium, magnesium, calcium and aluminum, (3) C_1 to C_8-alkanoyloxy- C_1 to C_5-alkyl, (4) C_1 to C_5-alkoxycarbonyloxy-C_1 to C_4-alkyl or (5) phthalidyl; and

Het is a heterocyclic radical selected from the group of triazolyl, tetrazolyl, thiadiazolyl, oxadiazolyl, thiazolyl, oxazolyl, isoxazolyl, triazinyl, pyridyl and pyrimidyl, said heterocyclic radicals being unsubstituted or substituted by (a) alkyl, (b) haloalkyl, (c) hydroxyalkyl, (d) alkoxyalkyl, (e) carboxylalkyl, (f) BOOC-alkyl wherein B is as defined above, (g) carbamoylalkyl, (h) N-alkylcarbamoylalkyl, (i) dialkylaminoalkyl, (j) sulfamoylalkyl, (k) alkylthioalkyl, all of the above said groups (a) to (k) containing 1 to 6 carbon atoms, (l) hydroxy, (m) oxo or (n) halogen.

20. A method for treating or preventing a bacterial infection of human or warm-blooded animal caused by bacteria sensitive to a compound as defined in claim **1** which comprises administering an antibacterially effective amount of the compound to the subject by enteral or parenteral route.

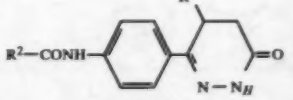
4,376,771

6-(P-ACYLAMINOPHENYL)-4,5-DIHYDROPYRIDAZ-3-ONES AND THERAPEUTIC AGENTS CONTAINING SAID COMPOUNDS

Rolf Lebkuecher; Marco Thyes; Horst Koenig, all of Ludwigshafen; Hans D. Lehmann, Hirschberg-Leutershausen; Josef Gries, Wachenheim; Dieter Lenke, Ludwigshafen, and Johannes Kunze, Plattling, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 101,537, Dec. 10, 1979, abandoned, which is a continuation of Ser. No. 913,642, Jun. 8, 1978, abandoned. This application Jan. 14, 1981, Ser. No. 224,939
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727481
Int. Cl.³ C07D *237/04*; A61K *31/50*
U.S. Cl. 424—250 **6 Claims**

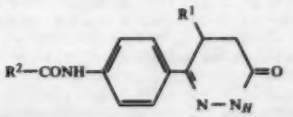
1. A 6-(p-acylaminophenyl)-4,5-dihydropyridaz-3-one of the formula I



I

where R^1 is alkyl of 1 to 3 carbon atoms and R^2 is halogen-substituted alkyl of 1 to 6 carbon atoms.

4. A therapeutic composition for inhibiting thrombocyte aggregation which comprises a therapeutically effective amount of a compound of the formula I



I

where R^1 is alkyl of 1 to 3 carbon atoms and R^2, is halogen-sub-

stituted alkyl of 1 to 6 carbon atoms, together with conventional carriers and excipients.

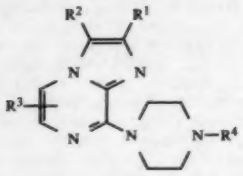
4,376,772

USE OF PIPERAZINYL-IMIDAZO[1,2-A]PYRAZINES IN SEDATION

Walfred S. Saari, Lansdale, and Joel R. Huff, Gwynedd, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 9, 1981, Ser. No. 328,894
Int. Cl.[3] A61K *31/195, 31/495, 31/505*
U.S. Cl. 424—250 7 Claims

1. A method of treating sedation caused by antihypertensive drug therapy through stimulation of presynaptic α_2-adrenergic receptors in a patient in need of such treatment which comprises the administration of 0.01–20 mg/kg/day of a compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein R^1, R^2 and R^3 are independently hydrogen or halogen; and R^4 is hydrogen or C_{1-3}alkyl.

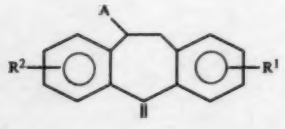
4,376,773

10-SUBSTITUTED 5-CYANOMETHYLENE-10,11-DIHYDRO-DIBENZO-[A,D]-CYCLOHEPTENES, THEIR PREPARATION, AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Gerd Steiner, Kirchheim; Hans P. Hofmann, Ludwigshafen; Horst Kreiskott, Wachenheim, and Hans-Juergen Teschendorf, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,964
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009045
Int. Cl.[3] A61K *31/495, 31/445, 31/55;* C07D *241/04*
U.S. Cl. 424—251 10 Claims

1. A 10-substituted 5-cyanomethylene-10,11-dihydro-dibenzo[a,d]-cyclopheptene of the formula I



I

where R^1 and R^2 are hydrogen, halogen, alkyl of 1 to 3 carbon atoms or trifluoromethyl, and A is piperazinyl, homopiperazinyl, piperidinyl or morpholinyl, an additional nitrogen atom being unsubstituted or substituted by alkyl of 1 to 3 carbon atoms, hydroxyalkyl of 2 or 3 carbon atoms, alkoxyalkyl, the alkoxy and alkyl radical each being of 1 to 3 carbon atoms, cycloalkyl or cycloalkylmethyl, of 3 to 7 carbon atoms in the cycloalkyl ring, or alkynyl of 2 to 5 carbon atoms and being additionally, where appropriate, substituted by oxygen in the form of an N-oxide, and its physiologically tolerated addition salts with acids.

10. A therapeutic sedative, hypnotic or tranquilizing agent, which contains a therapeutically effective amount of a compound of the formula I as defined in claim 1, or a pharmacologically tolerated acid addition salt thereof, as the active compound, together with conventional carriers and diluents.

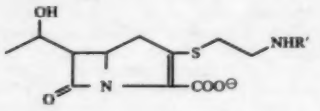
4,376,774

ANTIBIOTIC N-HETEROCYCLYL THIENAMYCIN

John Hannah, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

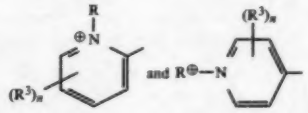
Filed May 29, 1979, Ser. No. 43,087
Int. Cl.[3] A61K *31/44;* C07D *401/14*
U.S. Cl. 424—263 4 Claims

1. A compound having the structural formula:



or a pharmaceutically acceptable salt or ester thereof wherein:

R′ is selected from the group consisting of:



wherein:

R is hydrogen, alkyl having from 1–6 carbon atoms, substituted alkyl having from 1–6 carbon atoms wherein the substituent is chloro, fluoro, hydroxyl, alkoxyl (C_{1-6}), carboxyl, amino, sulfo and mono- and dialkylamino wherein each alkyl has 1–6 carbon atoms substituted and unsubstituted phenylaklkyl and phenylalkenyl having 7–12 carbon atoms wherein the substituent is selected from chloro, fluoro, carboxyl, amino, cyano, hydroxyl and sulfo;

R^3 is chloro, fluoro, hydroxyl, carboxyl, sulfo, cyano, amino, mono- and diloweralkylamino, loweralkoxyl, alkyl having from 1–6 carbon atoms, substituted alkyl having 1–6 carbon atoms wherein the substituent is carboxyl, cyano, alkoxyl having 1–6 carbon atoms, phenyl and phenyloxy; and n is an integer selected from 0 to 3.

4. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

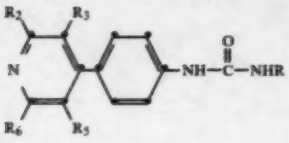
4,376,775

N-[4-(4-PYRIDINYL)PHENYL]UREAS AND THEIR CARDIOTONIC USE

George Y. Lesher, Schodack, and Donald F. Page, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

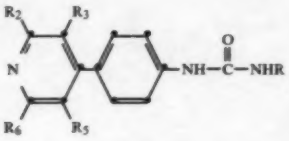
Continuation-in-part of Ser. No. 152,991, May 27, 1980, Pat. No. 4,317,827. This application Jul. 20, 1981, Ser. No. 285,379
The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.
Int. Cl.[3] C07D *213/54;* A61K *31/44*
U.S. Cl. 424—263 12 Claims

5. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically-effective amount of N-R-N′-[4-2-R_2-3-R_3-5-R_5-6-R_6-4-pyridinyl)phenyl]urea having the formula



where R is hydrogen, methyl or ethyl, R_2 is hydrogen, methyl, ethyl or hydroxyl, R_6 is hydrogen, methyl or ethyl, R_3 and R_5 are each hydrogen or methyl, or pharmaceutically-acceptable acid-addition salt thereof.

9. An N-R-N'-[4-(2-R_2-3-5 R_5-6-R_6-4-pyridinyl)phenyl]urea having the formula



where R is hydrogen, methyl or ethyl, R_2 is hydrogen, methyl, ethyl or hydroxyl, R_6 is hydrogen, methyl or ethyl, R_3 and R_5 are each hydrogen or methyl, or pharmaceutically-acceptable acid-addition salt thereof.

4,376,776

DIBENZOFURAN DERIVATIVES AND THEIR USE FOR CONTROLLING FUNGI

Costin Rentzea, Heidelberg; Karl-Heinz Feuerherd; Bernd Zeeh, both of Ludwigshafen; Hubert Sauter, Mannheim, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

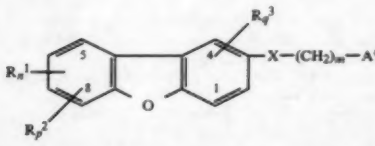
Filed Jan. 26, 1982, Ser. No. 342,931

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103069

Int. Cl.³ A01N *43/12*; C07D *307/91*

U.S. Cl. 424—267 **7 Claims**

1. A dibenzofuran derivative of the formula



(I)

where R^1, R^2 and R^3 are identical or different and each is halogen, unsubstituted or halogen-substituted alkyl or alkoxy of 1 to 4 carbon atoms, cyano or nitro, n, p and q are 0, 1, 2 or 3, X is oxygen or sulfur, m is 2, 3 or 4, $A^{\oplus}$ is quinuclidinium or pyrrolizidinium, or $-N^{\oplus}R^4R^5R^6$, where R^4, R^5 and R^6 are identical or different and each independently of one another is alkyl, alkenyl or alkynyl of not more than 6 carbon atoms, cycloalkyl of not more than 12 carbon atoms or cycloalkenyl of not more than 7 carbon atoms, which acyclic and cyclic radicals may be substituted by halogen, cyano, alkoxy of 1 to 4 carbon atoms or dialkylamino, where alkyl is of 1 to 4 carbon atoms, or is aralkyl which is unsubstituted or substituted by fluorine, chlorine, bromine, alkyl, alkenyl or alkoxy of not more than 4 carbon atoms, trifluoromethyl, nitro, cyano or alkoxycarbonyl of not more than 5 carbon atoms, or R^5 together with R^6 is part of a 5-, 6- or 7-membered saturated heterocyclic ring which contains from 1 to 3 hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur and may be substituted by methyl or ethyl, and $Y^{\ominus}$ is the anion of any desired non-phytotoxic acid HY.

6. A fungicidal agent containing inert additives and from 0.1 to 95% by weight of a dibenzofuran derivative of the formula I as defined in claim 1.

4,376,777

THIAZOLIDINE DERIVATIVES USE

Yutaka Kawamatsu, Kyoto; Takashi Sohda, Takatsuki, and Takeo Hirata, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

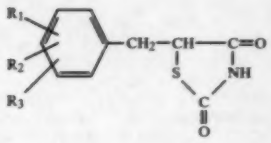
Filed Jan. 6, 1981, Ser. No. 222,881

Claims priority, application Japan, Jan. 7, 1980, 55-762

Int. Cl.³ C07D *277/04*; A61K *31/425*

U.S. Cl. 424—270 **19 Claims**

1. A thiazolidine compound of the formula:



wherein

R_1 is hydrogen, hydroxyl, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, or carboxylic acyloxy having 2 to 4 carbon atoms, and

each of R_2 and R_3 is hydroxyl, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, or carboxylic acyloxy having 2 to 4 carbon atoms,

or a pharmaceutically acceptable salt thereof.

4,376,778

ANTIBIOTIC SUBSTANCES AND PROCESSES FOR PRODUCTION THEREOF

Norio Ezaki; Takashi Shomura; Tomizo Niwa, all of Yokohama; Michio Kojima, Tokyo; Shigeharu Inouye, Yokohama, and Tatsuo Ito, Isehara, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,975

Claims priority, application Japan, Dec. 24, 1979, 54-166926

Int. Cl.³ C07D *207/42*; A61K *31/40*

U.S. Cl. 424—274 **2 Claims**

1. An SF-2080A substance having the following properties:

Elemental Analysis (by weight): C, 27.06%; H, 1.17%; N, 14.84%; Cl, 39.23%;

Molecular Weight: 181 (according to mass spectrum);

Molecular Formula: $C_4H_2N_2O_2Cl_2$;

Melting Point: 205° to 207° C. (with decomposition);

Optical Rotation: $[\alpha]_D^{25}=0$ (C=0.5, methanol);

Ultraviolet Absorption Spectrum: as shown in FIG. 1: The absorption maximums are 269 and 320 nm in a methanol solution, 271 and 320 nm in a 0.01-N hydrochloric acid methanol solution, and 220 and 325 nm in a 0.01-N sodium hydroxide methanol solution;

Infrared Absorption Spectrum: as shown in FIG. 2: The absorption bands, as determined using the potassium bromide tablet method, are 3270, 3150, 1570, 1510, 1480, 1400, 1360, 1280, 1200, 1140, 1070, 960, 830, 820, 750 cm^{-1};

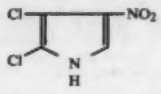
Color Reactions: positive for the iodine reaction and Lemieux reaction, and negative for the ninhydrin reaction and ferric chloride reaction;

Appearance and Color: light brown to yellow needle-shaped crystals;

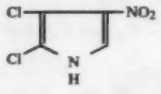
Electrical Properties: behaves as neutral substance on High Voltage Paper Electrophoresis;

Rf Values on Thin Layer Chromatography (silica gel): 0.68 (benzene/acetone=2:1 by volume), 0.73 (chloroform/methanol=10:1 by volume);

Solubility: easily soluble in methanol and acetone, soluble in chloroform, and sparingly soluble in water and n-hexane; and



2. An antimycotic agent containing a carrier and an antimycotically effective amount of an active component SF-2080A substance represented by the following formula:



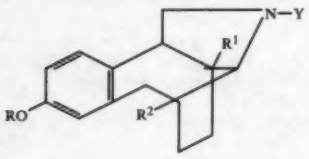
4,376,779

N-(SUBSTITUTED)-2-AZA-2'-HYDROXY-5,6-BENZOTRICYCLO[6.3.0^{1,5}.0^{4,11}] UNDECANE CENTRALLY-ACTING ANALGESICS

Patrice C. Belanger, Dollard des Ormeaux, and Robert N. Young, Senneville, both of Canada, assignors to Merck Sharp & Dohme (I.A.) Corp., Rahway, N.J.

Filed Jan. 26, 1981, Ser. No. 228,482
Int. Cl.^{3} C07D *209/70*; A61K *31/40*
U.S. Cl. 424—274 **13 Claims**

1. A compound of the formula



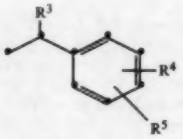
(I)

where

R is hydrogen or methyl;

R^1 and R^2 are each independently hydrogen or C_{1-4}alkyl; and

Y is (a) C_{1-4}alkyl; (b) C_{3-4}cycloalkylmethyl; (c) phenyl C_{1-4}alkyl; or (d) substituted benzyl of formula



wherein:

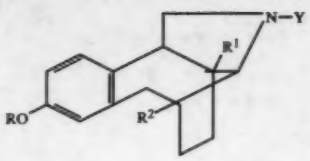
R^3 is hydrogen or C_{1-4}alkyl;

R^4 is hydrogen; and

R^5 is selected from the group consisting of (1) halo; (2) C_{1-4}alkyl; (3) C_{1-4}alkoxy; (4) amino, and mono- and di-(C_{1-4}alkyl) substituted amino; (5) cyano; (6) trifluoromethyl; (7) trifluoromethylthio; (8) C_{1-4}-alkylthio; (9) C_{1-4}alkylsulfoxide; (10) C_{1-4}alkylsulfone; (11) hydroxy; and (12) phenyl;

or a pharmaceutically acceptable acid addition salt thereof.

12. A method of treating pain comprising administering to a patient in need of such treatment of therapeutically effective amount of a compound of the formula:



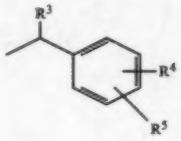
(I)

wherein

R is hydrogen or methyl;

R^1 and R^2 are each independently hydrogen or C_{1-4}alkyl; and

Y is (a) C_{1-4}alkyl; (b) C_{3-4}cycloalkylmethyl; (c) phenyl C_{1-4} alkyl; or (d) substituted benzyl of formula



wherein:

R^3 is hydrogen or C_{1-4}alkyl;

R^4 is hydrogen; and

R^5 is selected from the group consisting of (1) halo; (2) C_{1-4}alkyl; (3) C_{1-4}alkoxy; (4) amino, and mono- and di-(C_{1-4}alkyl) substituted amino; (5) cyano; (6) trifluoromethyl; (7) trifluoromethylthio; (8) C_{1-4}alkylthio; (9) C_{1-4}alkylsulfoxide; (10) C_{1-4}alkylsulfone; (11) hydroxy; and (12) phenyl;

or a pharmaceutically acceptable acid addition salt thereof.

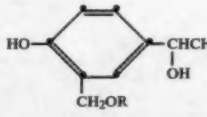
4,376,780

NOVEL PHENETHYLAMINE DERIVATIVES AND BRONCHDILATOR CONTAINING THE SAME

Noriyasu Hirose, Kokubunji, and Shigeru Souda, Tokyo, both of Japan, assignors to Eisai Co., Ltd., Japan

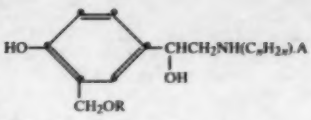
Division of Ser. No. 778,326, Mar. 16, 1977, Pat. No. 4,317,930.
This application Oct. 16, 1981, Ser. No. 312,341
Claims priority, application Japan, Mar. 19, 1976, 51-29175
Int. Cl.^{3} A01N *43/16*; C07D *317/00*
U.S. Cl. 424—282 **4 Claims**

1. A phenethylamine derivative represented by the general formula:



wherein R is a lower alkyl group, C_nH_{2n} is a branched or straight alkylene group, A is a phenyl group substituted with a lower alkylene dioxy group, and n is an integer from 1 to 4, and a pharmacologically acceptable acid-addition salt thereof.

3. A bronchdilator, comprising a bronchdilating amount of a phenethylamine derivative represented by the general formula:



wherein R is a lower alkyl group, C_nH_{2n} is a branched or straight alkylene group, A is a phenyl group substituted with a lower alkylene dioxy group, and n is an integer from 1 to 4, or a pharmacologically acceptable acid-addition salt thereof.

4,376,781

PHARMACEUTICAL COMPOSITIONS

Andrea Lietti, and Attilio Bonati, both of Milan, Italy, assignors to Inverni Della Beffa S.p.A., Milan, Italy

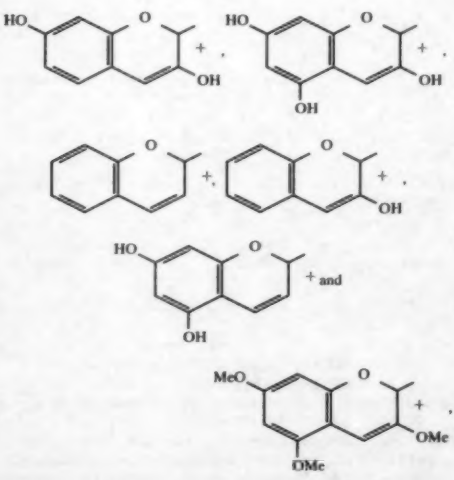
Filed Feb. 27, 1978, Ser. No. 881,892
Int. Cl.³ A61K *31/35*
U.S. Cl. 424—283 **22 Claims**

1. A pharmaceutical composition comprising,

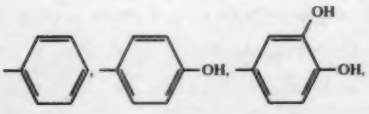
as active ingredient, a cicatrizing, epithelium-regenerating, anti-inflammatory, vaso-protective, hypolipemic, hypocholesterolemic or hypoglycemic response elliciting quantity of a flavylium salt of the structure

$$A^+ - B\ X^-$$

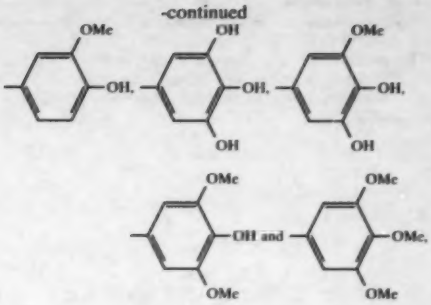
containing at least one hydroxy or methoxy substituent and wherein A^+ is selected from the group consisting of



B is selected from the group consisting of



-continued



and X^- is a pharmaceutically acceptable anion, and

a pharmaceutically acceptable diluent or carrier, with the proviso that where the composition consists of a solution of said flavylium salt, said solution also contains at least one pharmaceutically acceptable additive selected from the group consisting of preservatives and buffering, thickening, suspending, stabilizing, wetting, emulsifying, coloring and flavoring agents.

4,376,782

COMPLEXES OF SQUARE PLANAR PLATINUM II COMPOUNDS AND N-METHYL GLUCAMINE

John Turkevich, Princeton, N.J., and Joseph H. Burchenal, Noroton, Conn., assignors to Research Corporation, New York, N.Y.

Filed May 21, 1980, Ser. No. 151,976
Int. Cl.³ C01B *6/13;* **C07F** *15/00;* **C01B** *6/22*
U.S. Cl. 424—287 **21 Claims**

1. A cis-complex or -salt prepared by reacting a cis-square planar platinum compound with N-methyl-glucamine wherein two moles of N-methyl-glucamine are reacted with each mole of platinum compound.

21. A method of treating animal malignant tumor cells sensitive to a complex or salt of claim **1** comprising administering to an animal afflicted with said tumor cells an effective amount of said complex or salt sufficient to cause regression of the animal tumor cells.

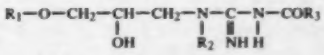
4,376,783

ACYLATED GUANIDINES AND MEDICAMENTS CONTAINING THEM

Jesus Anatol, deceased, late of Paris, France; by Marie-Francoise Anatol, legal representative; by Andre-Manuel Anatol, legal representative, both of Seine, France; Jean Berecoechea, Reims, France; Pierre Duchene-Marullaz, Chamalieres, France, and Alain Eschalier, Clermont-Ferrand, France, assignors to Compagnie Francaise de Sucerie, Paris, France

Filed Mar. 4, 1981, Ser. No. 240,512
Claims priority, application France, Mar. 7, 1980, 80 05190
Int. Cl.³ A61K *31/27, 31/165;* **C07C** *103/78, 125/063*
U.S. Cl. 424—300 **4 Claims**

1. An acylated guanidine corresponding to the general formula:



in which R_1 represents phenyl or naphthyl optionally substituted by a monovalent group of —Cl or lower alkyl; R_2 represents an alkyl, benzyl or cycloalkyl group and R_3 represents phenyl, phenoxy, benzyloxy or alkyloxy group.

2. A composition for obtaining beta-blocking effects for the treatment of arterial hypertension, ischemic diseases of heart

and rhythmic disorders of the latter, comprising a compound according to claim 1 in an amount effective for such a purpose, and a pharmaceutically acceptable carrier.

4. Method of treating human or animals to obtain beta-blocking effects for arterial hypertension, ischemic diseases of the heart and rhythmic disorders of the latter, by administrating to the subject a medicament comprising a compound according to claim 1.

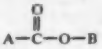
4,376,784

PESTICIDAL FLUORINATED ESTERS OF THE PYRETHRIN OR PYRETHROID TYPE

Donald W. G. Harney, Doncaster; Peter G. Lehman, Tullamarine, and Joseph C. Rundle, Nunawading, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

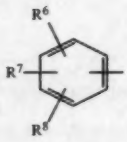
Division of Ser. No. 46,757, Jun. 8, 1979, Pat. No. 4,283,414. This application Mar. 24, 1981, Ser. No. 246,931
Claims priority, application Australia, Jun. 21, 1978, PD 4813
Int. Cl.[3] C07C *69/614;* A01N *37/10*
U.S. Cl. 424—304 11 Claims

1. An ester of the formula



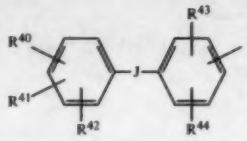
wherein:
A is the group

wherein:
V is the group



in which R^6, R^7 and R^8 are independently chosen from the group consisting of hydrogen, halogen, cyano, nitro, C_1 to C_6 alkyl optionally substituted with halogen atoms or C_1 to C_6 alkoxy, C_2 to C_6 alkenyl optionally substituted with halogen atoms, C_2 to C_6 alkynyl optionally substituted with halogen atoms, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio;
W is chosen from the group consisting of C_1 to C_6 alkyl optionally substituted with halogen, C_2 to C_6 alkenyl optionally substituted with halogen and C_2 to C_6 alkynyl;
X is chosen from hydrogen and fluorine; and
B is the group

wherein:
Q is chosen from



in which

in which R^{40}, R^{41}, R^{42}, R^{43} and R^{44} are independently chosen from hydrogen, C_1 to C_6 alkyl, halogen and C_2 to C_6 alkenyl and J is oxygen; T is chosen from hydrogen, halogen, cyano, C_1 to C_6 alkyl optionally substituted with halogen, C_2 to C_6 alkenyl and C_2 to C_6 alkynyl; and X in the B substituent is as defined above for A with the proviso that at least one of the X substitutents is fluorine.

5. An insecticidal or acaricidal composition comprising as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1 and an inert carrier therefor.

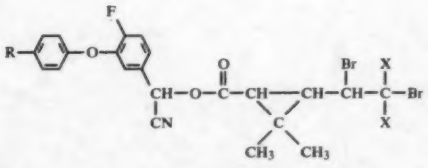
4,376,785

CYCLOPROPANECARBOXYLATES AND A LOW FISH TOXIC INSECTICIDE AND/OR ACARICIDE CONTAINING THEM

Noritada Matsuo, Itami, and Masachika Hirano, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 9, 1981, Ser. No. 272,045
Claims priority, application Japan, Jun. 19, 1980, 55-83474; Dec. 29, 1980, 55-185574
Int. Cl.[3] A01N *53/00;* C07C *121/75*
U.S. Cl. 424—304 8 Claims

1. A compound of the formula,



wherein R and X may be same or different, each is a chlorine or bromine atom.

5. A method for controlling an insect and/or acarid which comprises applying an insecticidally and/or acaricidally effective amount of the compound according to claim 1 to the insect and/or acarid.

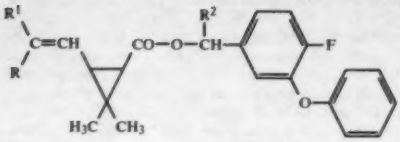
4,376,786

COMBATING ARTHROPODS WITH 4-FLUORO-3-PHENOXY-BENZYL 3-ALKEN-1-YL-2,2-DIMETHYL-CYCLOPROPANECARBOXYLATES

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,688
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110725
Int. Cl.[3] A01N *53/00;* C07C *69/743, 121/75*
U.S. Cl. 424—304 6 Claims

1. A 4-fluoro-3-phenoxy-benzyl 3-alken-1-yl-2,2-dimethyl-cyclopropanecarboxylate of the formula



wherein

R is alkyl or alkenyl,

R^1 is hydrogen or alkyl different from R, and

R^2 is hydrogen, cyano, or alkyl, alkenyl or alkynyl each having up to 4 carbon atoms.

6. A method of combating pests comprising applying to the pests, or to a habitat thereof, a pesticidally effective amount of a compound according to claim **1**.

4,376,787

CONTROL OF MASTITIS

Steven E. Lentsch, and William Schmidt, both of Saint Paul, Minn., assignors to Economics Laboratory, Inc., Saint Paul, Minn.

Filed Dec. 3, 1979, Ser. No. 99,735
Int. Cl.³ A61K *31/185, 31/255, 31/66*
U.S. Cl. 424—315 **28 Claims**

1. A method for killing mastitis-causing gram negative organisms including *Pseudomonas aeruginosa, Escherichia coli,* or *Klebsiella pneumoniae* or gram positive organisms including *Staphylococcus aereus* on an animal's teats comprising the step of treating the teats of the animal with an thickened aqueous medium formulated to ensure a contact time between the teats and the medium of 15 seconds to 15 minutes, the medium comprising:

(a) anionic surfactant of the formula

$$RAO_x^- M^+$$

wherein R is essentially organic, A is sulfur or phosphorus, x is 3 or 4, and M is topically acceptable cation; and

(b) a pH modifying or maintaining substance in an amount sufficient to adjust a pH of the composition to a value in the range of 2.0 to 5.0.

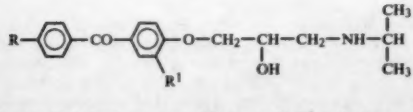
4,376,788

BASIC ETHERS OF 4-HYDROXY-BENZOPHENONES ACTING AS BETA-BLOCKING AGENTS

Roberto Montanari, Milan, Italy, assignor to Stabilimento Bioterapico Farmacologico La Farmochimica Italiana, S.p.A., Milan, Italy

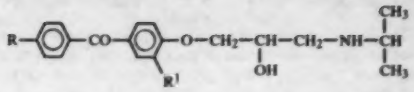
Filed Feb. 12, 1981, Ser. No. 233,948
Claims priority, application Italy, Feb. 13, 1980, 19887 A/80
Int. Cl.³ C07C *97/10;* **A61K** *31/135*
U.S. Cl. 424—330 **2 Claims**

1. A compound of the formula:



wherein R is hydrogen or chlorine and R^1 is hydrogen or acetyl, and pharmaceutically acceptable salts thereof.

2. A pharmaceutical beta-blocking composition containing, as an active ingredient thereof, a compound of the formula:



wherein R is hydrogen or chlorine and R^1 is hydrogen or acetyl, or its pharmaceutically acceptable salts.

4,376,789

SURFACTANTS WHICH ARE POLYHYDRIC ALCOHOL PARTIAL ESTERS OF ADDUCTS OF MALEIC ANHYDRIDE WITH AN UNSATURATED CARBOXYLIC ACID

Norbert Lowicki, Duisburg, and Natvarlal B. Desai, Dinslaken, both of Fed. Rep. of Germany, assignors to Grillo-Werke AG, Duisburg-Hamborn, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,606
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032612
Int. Cl.³ A61K *47/00, 31/70;* **C07H** *13/06;* **C07C** *69/74*
U.S. Cl. 424—361 **12 Claims**

1. A product of the group consisting of polyhydric alcohol partial esters of a polycarboxylic acid from a Diels-Alder adduct of maleic anhydride with an unsaturated carboxylic acid having a 10 to 25 carbon chain, and sulfonate derivatives thereof.

6. A cosmetic product suitable for application to the skin containing a partial ester as defined in any one of claims **1** to **5**.

4,376,790

FEED SUPPLEMENT FOR RUMINANT ANIMALS

Stanley R. Ames, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,492
Int. Cl.³ A23K *1/22;* **A23L** *1/30*
U.S. Cl. 426—2 **44 Claims**

1. A feed composition for ruminant animals comprising about 8–84% by weight of ammonium isobutyrate, and about 92–16% by weight of a combination of ammonium valerate, ammonium isovalerate and ammonium 2-methylbutyrate.

4,376,791

FRUCTOSE-CONTAINING FROZEN DESSERT PRODUCTS

James L. Holbrook, Illiopolis, and Laren M. Hanover, Mt. Zion, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jan. 11, 1982, Ser. No. 338,820
Int. Cl.³ A23G *9/04*
U.S. Cl. 426—565 **17 Claims**

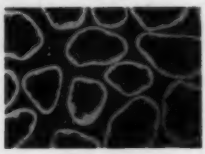
1. A frozen dessert composition of a smooth, creamy textural consistency formulated with milk protein, lactose, butterfat, starch-derived sweeteners and maltodextrin wherein at least 70% by weight of the non-fat solids are sweetener solids, said composition comprising 30 parts by weight fructose with fructose comprising at least 25% by weight of the total monosaccharide and disaccharide sweetener weight of the frozen dessert composition, about 10 to about 40 parts by weight lactose and about 10 to about 60 parts by weight milk protein and maltodextrin with the maltodextrin comprising from 20% to 80% of the total milk protein and maltodextrin weight and the weight ratio of fructose to maltodextrin ranges from about 6:1 to about 1:3.

4,376,792

METHOD FOR PRIMARY CONTAINMENT OF CESIUM WASTES

Peter Angelini; Walter J. Lackey, both of Oak Ridge; David P. Stinton, Knoxville; Raymond E. Blanco, Oak Ridge; Walter D. Bond, Knoxville, and Wesley D. Arnold, Jr., Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 3, 1981, Ser. No. 298,969
Int. Cl.³ G21C 3/06
U.S. Cl. 427—6 2 Claims



1. A method for producing a cesium-specific waste form, characterized by a high degree of mechanical integrity and compositional stability, comprising, in combination, the steps of:

(a) subjecting a cesium-specific zeolite containing cesium values to a rapid heating schedule within an air environment of about 100° C./hour until a temperature within the range of about 550° C. to 650° C. is attained;

(b) maintaining this temperature for up to about four hours to effect removal of volatiles and moisture from the zeolite thereby retentively immobilizing cesium within stablized zeolite; and

(c) coating the zeolite with at least one dense layer of pyrolytic carbon by confinement for sufficient duration within a suitable coating environment operating at about 1,000° C. while utilizing a carbon-donor gas selected from the group consisting essentially of acetylene and propylene and an inert fluidizing gas selected from the group consisting essentially of argon, nitrogen, and helium to effect a solidifed, cesium-retentive waste form.

4,376,793

PROCESS FOR FORMING A HARDFACING SURFACE INCLUDING PARTICULATE REFRACTORY METAL

Hewy E. Jackson, Livingston, Tex., assignor to Metallurgical Industries, Inc., Tinton Falls, N.J.

Filed Aug. 28, 1981, Ser. No. 297,339
Int. Cl.³ B05D 1/08
U.S. Cl. 427—34 17 Claims

1. A process for forming a hardsurfacing including refractory metals carbide particles on a wear surface of an element which comprises:

(a) positioning a plasma arc proximal to a wear surface of an element;

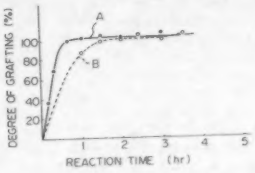
(b) passing a hardfacing powder through said plasma arc to form a hardfacing surface on said element; the hardfacing powder comprising refractory metal carbide particles and a hard metal matrix, the refractory metal carbide appearing in amounts of approximately 50 to 65% by weight of the hard metal and refractory metal carbide; the hard metal consisting by weight of approximately 0% to 2.3% carbon; 22% to 37% chromium; 0% to 20% nickel with the balance iron.

4,376,794

PROCESS FOR PRODUCTION OF SEPARATORS FOR USE IN CELLS

Sueo Machi, Takasaki; Isao Ishigaki, Maebashi; Takanobu Sugo, Gunma; Kazuo Murata; Shiro Tanso, both of Takatsuki, and Keizi Senoo, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Inst., Tokyo and Yuasa Battery Co., Ltd., Osaka, both of, Japan

Continuation-in-part of Ser. No. 118,101, Feb. 4, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,904
Claims priority, application Japan, Feb. 5, 1979, 54-11982; Feb. 5, 1979, 54-11984; Feb. 5, 1979, 54-11986; Feb. 5, 1979, 54-11988
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 20 Claims



1. A process of the production of separators for use in cells comprising

irradiating a film of an organic polymer 150 μm or less thick with ionizing radiation at a dose rate of 5×10^{4}–10^{7} rads/sec. to give a total dose of 1 Mrad or more,

thereafter contacting the irradiated film with an aqueous solution of a terminally unsaturated monomer substantially free of oxygen and containing at least one chlorine-containing organic solvent selected from the group consisting of ethylene dichloride and carbon tetrachloride, at a temperature of 10° C.–60° C. to thereby bring about the graft copolymerization of said monomer onto said film and

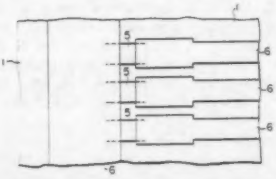
then treating the grafted film with an aqueous alkaline solution.

4,376,795

METHOD OF PRODUCING IMAGE SENSOR

Kazumi Komiya, Yokosuka; Toshio Yamashita, Katano, and Masaru Ohno, Kashiwa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp.; Matsushita Electric Industrial Co., Ltd., both of Tokyo and Matsushita Graphic Communication Systems, Inc., Osaka, all of, Japan

Filed Sep. 8, 1981, Ser. No. 300,105
Claims priority, application Japan, Sep. 9, 1980, 55-123992
Int. Cl.³ B05D 1/02, 3/04, 1/36, 5/12
U.S. Cl. 427—75 2 Claims



1. A method of producing a contact type image sensor, which comprises forming a thin CdS film on an insulating substrate by chemical deposition or chemical spray, forming on this film a thin CdSe or CdTe film, subjecting said two layers to an activating heat treatment in an atmosphere containing vapor of at least one of the halides of Cd which is a common flux for said two layers at a temperature above the eutectic temperature of said two layers and said Cd halide, thereby turning said two layers into a solid solution, then

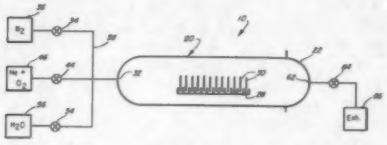
selectively removing said solid solution layer to form a plurality of photoconductor islands, and further forming the electrodes connecting to said photoconductor islands.

4,376,796

PROCESSING SILICON WAFERS EMPLOYING PROCESSING GAS ATMOSPHERES OF SIMILAR MOLECULAR WEIGHT

Robert D. Arrasmith, Santa Ana; Thomas R. Barnhart, Yorba Linda, and Jon C. Goldman, Orange, all of Calif., assignors to Thermco Products Corporation, Orange, Calif.

Filed Oct. 27, 1981, Ser. No. 315,572
Int. Cl.³ H01L *21/316*
U.S. Cl. 427—82 **25 Claims**



1. In a process wherein silicon wafers are processed in a processing chamber, which is pressurized sequentially with an atmosphere X, and wherein an atmosphere Y displaces the atmosphere X except for a residual portion remaining with the atmosphere Y and diminishing in concentration with time, an improvement wherein the atmosphere X has a mean molecular weight substantially similar to a mean molecular weight of the atmosphere Y, in order to eliminate stratification of atmosphere X with respect to atmosphere Y during the period that atmosphere Y is displacing atmosphere X by causing a density of atmosphere X to be substantially equal to a density of atmosphere Y.

4,376,797

PRETREATING INORGANIC SURFACES WITH AMMONIUM SALT OF THIOGLYCOLIC ACID

Clifford G. Howse, Al-Khobar, Saudi Arabia, assignor to Mohammed N. Al-Hajry, Ak-Lhobar, Saudi Arabia

Filed Aug. 3, 1981, Ser. No. 289,646
Int. Cl.³ B05D *3/10*
U.S. Cl. 427—302 **8 Claims**

1. A method of treating a surface of an inorganic material comprising the steps of applying to a surface of the material a composition containing an alkaline solution of an ammonium salt of thioglycolic acid and applying over the said composition a film-forming coating composition which is based on a resin selected from the group consisting of polyurethane resins, alkyd resins and epoxy resins and which also contains an ammonium salt of thioglycolic acid and/or an anti-oxidant.

4,376,798

MASS CONNECTOR DEVICE

Stephen H. Diaz, Los Altos Hills, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 172,897, Jul. 28, 1980. This application Dec. 11, 1981, Ser. No. 329,976
Int. Cl.³ B65D *65/28;* **B32B** *3/20*
U.S. Cl. 428—43 **10 Claims**

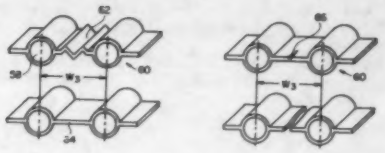
1. A connector device for connecting substrates which comprise:

first and second sheets having an original heat-stable shape, said shape being changed to a second heat-unstable shape, and thereafter being formed into alternate working and bonding zones having horizontal center lines, said bonding zones comprising compliant regions for maintaining the distance between the working zone center lines upon recovery of the device,

said first and second sheets having substantially the same expansion ratios, and

said sheets being brought into proper registry with one another at their bonding zones and thereafter being bonded.

5. The device of claim **1** wherein the compliant region comprises corregations which recover to a substantially heat-stable flat shape.



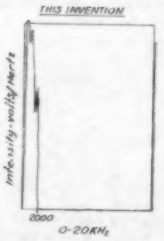
6. The device of claim **1** wherein the compliant region comprises a weakened area in each bonding zone approximately midway between the center lines of the working zones such that upon application of heat the working zones break apart forming separate connectors.

4,376,799

QUIET FILM AND CONTAINER

Martin H. Tusim, Fresno, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 16, 1980, Ser. No. 187,660
Int. Cl.³ B32B *7/02, 27/08;* **A61F** *5/44*
U.S. Cl. 428—213 **11 Claims**



1. A substantially rustle-free thermoplastic product having a film body comprising a multilayer structure, said structure having at least two skin layers and a core layer, a skin layer of said structure comprising a resin blend, a major component of said blend being a chlorinated polyethylene resin, said film when measured against a background noise generating a frequency reading of about 600 Hertz having a noise level generating a frequency reading of less than 4000 Hertz, the composition of the chlorinated polyethylene comprising between about 25 and 50 weight percent chlorine and the balance being substantially an olefinic polymer or copolymer, said polymer or copolymer being low or medium density polyethylene or an ethylene copolymer which comprises ethylene in at least one monoethylenically unsaturated comonomer or a blend of one or more of such polymers or copolymers; the blend of the layer comprising between about 40 and 95 weight percent of the chlorinated polyethylene resin, said core layer being of a different resin than either of said skin layers.

9. The product of claim **1** wherein each of the skin layers is comprised of said blend and is about 1 mil or greater in thickness.

4,376,800

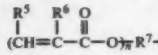
OPTICAL LENSES PREPARED FROM CROSSLINKABLE ACRYLIC COMPOSITIONS

Chen-i Lu, and Edward D. Morrison, both of 1669 Lake Ave., Rochester, N.Y. 14650

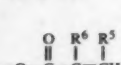
Filed Apr. 13, 1981, Ser. No. 253,481
Int. Cl.[3] C08F 22/38
U.S. Cl. 428—220 9 Claims

1. An optical lens having an absorbance of less than about 0.1 for visible radiation of a wavelength in the range of from about 400 to about 600 nanometers, said lens having been prepared by

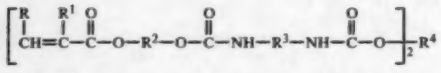
introducing into a lens-forming means a crosslinkable composition consisting essentially of: (1) an acrylic monomer having the formula



wherein n is 1 to 3; each of R^5 and R^6 is hydrogen, methyl or halo; R^7 is a polyvalent aliphatic, alicyclic or aromatic group, and R^8 is hydrogen or



and (2) an acrylated urethane oligomer having the formula



wherein each of R and R^1 is hydrogen, methyl or halo; each of R^2 and R^3 is alkylene, cycloalkylene or arylene; and R^4 is a divalent aliphatic, alicyclic or aromatic radical, said composition exhibiting a shrinkage upon curing of less than about 0.4%, and

curing said composition in said lens-forming means until it is substantially crosslinked.

4,376,801

SELECTIVE COATING FOR SOLAR COLLECTORS

Daniel J. Schardein, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 19, 1982, Ser. No. 379,616
Int. Cl.[3] B32B 9/00; F24J 3/02
U.S. Cl. 428—336 6 Claims

1. A solar collector comprising an aluminum or steel solar energy collection surface, said collection surface having a selective solar coating thereon, said coating comprising an organic material having a high carbon content and a high molecular weight and being selected from the group consisting of tung oil, castor oil, corn oil, soybean oil, palm oil, lard, butterfat, beeswax, vinyl polymers and petroleum oils, said coating having been pyrolyzed to produce a carbon black pigmented varnish having an absorptance of at least about 0.9 and an emittance not higher than about 0.4.

4,376,802

FINISH COMPOSITION FOR POLYESTER YARN

Robert M. Marshall, Chester, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 24, 1980, Ser. No. 114,819
Int. Cl.[3] D06M 15/10, 15/52, 15/58, 15/70
U.S. Cl. 428—378 42 Claims

1. A synthetic filamentary yarn comprised of polyester filaments which are treated with from about 1.2 to 7.0 weight percent based on the weight of the yarn of a liquid composition comprising about 24 to 86.4 weight percent of water, about 10 to 50 weight percent of a stiffener selected from the group consisting of triazines, melamine, and urea-formaldehyde resins, about 3 to 20 weight percent of a water-soluble lubricant, about 0.4 to 5 weight percent of a catalyst for the stiffener, and about 0.2 to 1 percent of a wetting agent.

13. A fiber finish composition, particularly for application to polyester yarn prepared by a process involving spinning and drawing steps, said composition comprising: about 24 to 86.4 percent of water, about 10 to 50 weight percent of a stiffener selected from the group consisting of triazines, melamine and urea-formaldehyde resins, about 3 to 20 weight percent of a water-soluble lubricant, about 0.4 to 5 weight percent of a catalyst for the stiffener, and about 0.2 to 1 weight percent of a wetting agent, said composition being applied as an overfinish to the yarn after drawing the yarn.

31. In a process for the production of a woven fabric wherein the cords of at least one weaving direction of the fabric are made from a polyester yarn, the yarn being prepared by a process involving spinning and drawing steps, the improvement which comprises:

(a) treating the yarn subsequent to the drawing step with from about 1.2 to 7.0 weight percent based on the weight of the yarn of a liquid composition comprising about 24 to 86.4 weight percent of water, about 10 to 50 weight percent of a stiffener selected from the group consisting of triazines, melamine and urea-formaldehyde resins, about 3 to 20 weight percent of a water-soluble lubricant, about 0.4 to 5 weight percent of a catalyst for the stiffener, and about 0.2 to 1 weight percent of a wetting agent;

(b) twisting the yarn into cord;

(c) weaving a fabric which utilizes the treated cords in at least one weaving direction; and

(d) exposing the fabric for an effective time period to a temperature which causes the composition to stiffen the fabric.

4,376,803

CARBON-REINFORCED METAL-MATRIX COMPOSITES

Howard A. Katzman, Los Angeles, Calif., assignor to The Aerospace Corporation, Los Angeles, Calif.

Filed Aug. 26, 1981, Ser. No. 296,957
Int. Cl.[3] B32B 9/00, 9/04; B05D 3/12, 3/02
U.S. Cl. 428—408 25 Claims

1. A carbon fiber reinforced metal matrix comprising:

(a) a continuous multifilament carbon fiber;

(b) an oxide film operative to coat substantially surfaces of the multifilament carbon fiber; and

(c) a metal matrix material infiltrated throughout and adhered to the multifilament carbon fiber.

4,376,804

PYROLYZED PITCH COATINGS FOR CARBON FIBER

Howard A. Katzman, Los Angeles, Calif., assignor to The Aerospace Corporation, Los Angeles, Calif.

Filed Aug. 26, 1981, Ser. No. 296,958
Int. Cl.[3] B32B 9/00, 9/04; B05D 3/12, 3/02
U.S. Cl. 428—408 22 Claims

1. A carbon fiber reinforced metal matrix composite comprising

a. a continuous multifilament carbon fiber;

b. an amorphous carbon coating operative to be deposited as a relatively uniform layer on substantially all surfaces of said multifilament carbon fiber to a predetermined depth;

c. an oxide film that has been applied to the surface areas of said amorphous carbon coating; and

d. a metal matrix infiltrated throughout and adhered to said multifilament carbon fiber.

4,376,805

FUSED CAST BLOCKS BASED ON REFRACTORY OXIDES AND HAVING A STEEL MEMBER EMBEDDED THEREIN

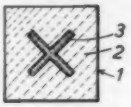
Marc Esnoult, Sorgues, and Jean-Claude Hugues, Le Thor, both of France, assignors to Societe Europeenne des Produits Refractaires, Neuilly-sur-Seine, France

Division of Ser. No. 62,289, Jul. 31, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,103

Claims priority, application France, Aug. 8, 1978, 78 23340

Int. Cl.³ B32B *9/00, 15/04*

U.S. Cl. 428—409 6 Claims



1. A process for the manufacture of a fused cast block of a refractory oxide material comprising the following steps: (a) casting a molten, previously fused refractory oxide-based material into a mold, (b) introducing and withdrawing an elongated steel member into said molten material a multiplicity of times so as to coat the elongated steel member with a solid layer of refractory oxide-based material, (c) extending at least a part of said resulting coated steel member into the interior of the fused refractory oxide-based material, and (d) cooling the resultant refractory oxide-based material having said coated steel member embedded therein slowly to ambient temperature.

4,376,806

HIGHLY ADHESIVE COATINGS FOR BERYLLIA

Josef Intrater, Englewood Cliffs, N.J., and Gene Bertoldo, New York, N.Y., assignors to Advanced Technology, Inc., Palisades Park, N.J.

Continuation-in-part of Ser. No. 200,514, Oct. 24, 1980, Pat. No. 4,358,506, and a continuation-in-part of Ser. No. 242,716, Mar. 11, 1981, and a continuation-in-part of Ser. No. 268,015, May 28, 1981, Pat. No. 4,374,903. This application Oct. 27, 1981, Ser. No. 315,452

Int. Cl.³ B32B *15/04*

U.S. Cl. 428—469 10 Claims

1. A composite of beryllium oxide and tin or tin alloys, wherein tin or tin alloy comprise as an additive a carbide or carbonyl former, said composite having the tin and tin alloy as a highly adherent coating, film, or layer on a beryllium oxide base or substrate, said coating characterized by being non-dewettable upon heat cycling, having a zero or negative angle of contact and having penetrability in interstices or through an aperture in said substrate.

4,376,807

TREATMENT OF FORMALDEHYDE LADEN WOOD PANELS TO REDUCE EXCESS FORMALDEHYDE

Dickson Y. Cannon, Anchorage, Ky., and Norman G. Wolfe, New Albany, Ind., assignors to Reliance Universal, Inc., Louisville, Ky.

Filed Oct. 27, 1980, Ser. No. 200,772

Int. Cl.³ B32B *21/08, 27/42*

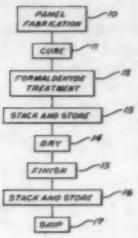
U.S. Cl. 428—528 9 Claims

1. A method of after treating formaldehyde laden wood panel products to reduce the emissions of free formaldehyde from the product, the method comprising the steps of

treating at least one side surface of the panel subsequent to composition of the panel with an ammonium salt solution, the ammonium salt being one which hydrolizes at ambient temperatures below 120° F. in the presence of water to form ammonium hydroxide and a weak acid, wherein the ammonium hydroxide decomposes to generate ammonia in sufficient degree to be available to react with the free formaldehyde in the wood product;

establishing a barrier between the treated panel side and the ambient environment to minimize loss of vaporous ammonia to the ambient environment;

and maintaining the treated panel with the barrier in place for a predetermined time sufficient to allow the vaporous



ammonia to migrate into the formaldehyde laden zones of the panel;

whereby a stable reaction product of gaseous ammonia and formaldehyde is formed, substantially reducing the emission of formaldehyde from the wood panel product.

9. A formaldehyde-laden wood panel product treated in accordance with the method of claim 1 to reduce the emission of free formaldehyde from the product.

4,376,808

LINING UNIT

Vladimir D. Kudinov, ulitsa Kosmonavtov, 82, kv. 29, and Boris V. Filimonov, ulitsa Kirovogradskaya, 19, kv. 19, both of Sverdlovsk, U.S.S.R.

Filed Oct. 16, 1980, Ser. No. 197,757

Int. Cl.³ F27D *1/04*

U.S. Cl. 428—558 4 Claims

1. A lining unit comprising: a metallic shell formed with a pipe of rectangular cross section; a metallic plate placed inside said metallic shell and diffusion-joined thereto; a wear-resistant composite material filling said metallic shell and diffusion-joined to said metallic shell and said metallic plate.

4,376,809

SODIUM SULPHUR BATTERIES AND CELL MODULES THEREFOR

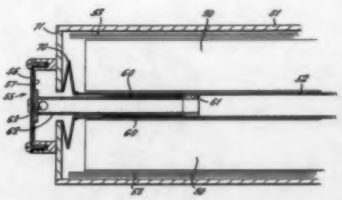
Peter J. Bindin, Runcorn, England, assignor to Chloride Silent Power Limited, London, England

Filed Jul. 14, 1981, Ser. No. 283,310

Claims priority, application United Kingdom, Nov. 6, 1980, 8035725

Int. Cl.³ H01M *10/50*

U.S. Cl. 429—62 16 Claims



1. A module for a sodium sulphur battery comprising a container having at least one sodium sulphur cell, a flow passage for a heat transfer fluid through the container, a flow control valve in the flow passage, and temperature-responsive

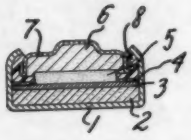
means arranged to control said valve in accordance with temperature and operative to close the flow control valve to prevent or reduce flow of fluid through said passage over a predetermined temperature range and to open said flow control valve at temperatures both above and below said predetermined temperature range.

4,376,810

ALKALINE CELL

Kazutoshi Takeda, and Koichi Sugimoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Continuation of Ser. No. 100,852, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 878,482, Feb. 16, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 187,529
Claims priority, application Japan, Feb. 21, 1977, 52-17980
Int. Cl.³ H01M *10/48*
U.S. Cl. 429—90 **8 Claims**



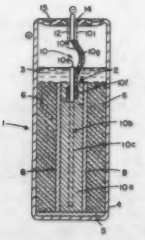
1. In an electrochemical cell of the type which generates electrical energy and exhibits an output discharge voltage: an anode cap; and a consumable anode contained within said anode cap and comprised of a main anode active material and a secondary anode active material present in amounts effective to obtain a cell discharge voltage at one substantially constant voltage level during substantially the whole useful life of the cell due to consumption of said main anode active material followed by an abrupt lowering of the cell discharge voltage to a distinctly lower voltage level for substantially the remainder of the cell useful life due to consumption of said secondary anode active material thereby enabling detection of the approaching exhaustion of the cell by the abrupt change of the cell discharge voltage, said main anode active material comprising zinc and said secondary anode active material comprising indium present in an amount of from more than 2% to 10% by weight with respect to the weight amount of said zinc, and said secondary anode active material being disposed principally along the interior surface of said anode cap.

4,376,811

ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 21, 1981, Ser. No. 333,094
Int. Cl.³ H01M *2/30*
U.S. Cl. 429—101 **25 Claims**



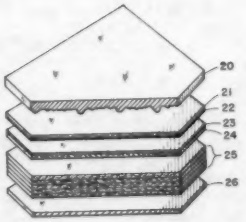
1. An electrochemical cell, comprising:
a metal housing and a cover for said housing, said cover having a metal electrical terminal extending therethrough; and
an electrochemical system within the metal housing and including an electrolytic solution and a battery stack exposed to the electrolytic solution, said electrolytic solution including a catalytically-reducible soluble cathode, and said battery stack comprising:
a cathode structure adjacent to the metal housing and operative during discharge of the cell to catalytically reduce the soluble cathode of the electrolytic solution; and
an anode structure comprising:
a metal electrode spaced from the cathode structure and the metal housing;
an electrically-nonconductive member disposed within the metal electrode;
an electrically-conductive metal material at the potential of the metal electrode and disposed on the electrically-nonconductive member and in physical and electrical contact with the metal electrode;
an electrically-conductive, metal jumper element at the potential of the metal electrode and connected between the electrically-conductive metal material and the electrical terminal in the cover; and
a chemically-stable, anti-parasitic discharge material disposed on the metal jumper element and operative to prevent the catalytic reduction of the soluble cathode in the electrolytic solution at the surface of the jumper element covered by the anti-parasitic discharge material.

4,376,812

THREE COLOR HIGH PRESSURE DECORATIVE LAMINATE HAVING REGISTERED COLOR AND EMBOSSING

Wilbur W. West, Cincinnati, Ohio, assignor to Formica Corporation, Wayne, N.J.

Filed Sep. 29, 1980, Ser. No. 191,986
Int. Cl.³ B32B *3/30, 31/20*
U.S. Cl. 428—165 **8 Claims**



1. A method of producing a multicolored decorative laminate having registered color and embossment comprising:
A. assembling, in superimposed relationship, a laminate assembly comprising:
(I) a rigidity-imparting substrate,
(II) a resin impregnated fibrous background sheet,
(III) a coating of a flowable, pigmented resin,
(IV) a release sheet having an ink layer on the surface thereof adjacent to said background sheet, said ink being flowable during heat and pressure consolidation and (V) an embossing press plate having a surface with protuberant and valley areas capable of being impressed into at least said release sheet,
B. heat and pressure consolidating said assembly so as to transfer said ink layer to the surface of said coating, and cause flow of the transferred ink and said coating from the areas of high pressure to the areas of low pressure,

C. removing said release sheet and said embossing press plate from the ink-surfaced, embossed laminate and

D. recovering the resultant laminate.

6. A heat and pressure consolidated laminate of registered embossment and color contrast comprising, in superimposed relationship,

(1) a rigidity-imparting substrate,

(2) a fibrous, background sheet impregnated with a first thermoset melamine/formaldehyde resin,

(3) a coating of a pigmented, second thermoset melamine/-formaldehyde resin positioned above said (2) and

(4) an ink having a color different from said (2) and (3) positioned above said (3), the surface of said laminate containing an embossment consisting of protuberances and valleys each of which are of a different color, the color of said (2) being primarily evidenced at the valleys thereof, the color of said second resin being evidenced at the lower areas of said protuberances and said ink being primarily evidenced at the higher areas of said protuberances.

4,376,813

REVERSAL DEVELOPMENT METHOD OF ELECTROSTATIC LATENT IMAGE BY THE USE OF HIGH-RESISTIVITY MAGNETIC TONER

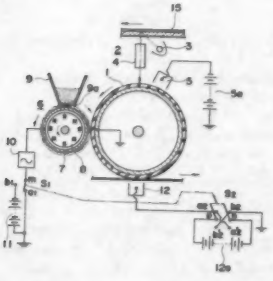
Shizuo Yuge, Okazaki; Toshio Yamamoto, Sakai, and Susumu Sakakibara, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 20, 1982, Ser. No. 341,148

Claims priority, application Japan, Jan. 30, 1981, 56-13505

Int. Cl.³ G03G *13/09*

U.S. Cl. 430—100 **6 Claims**



1. A reversal development method of visualizing an electrostatic latent image through development, comprising the steps of:

forming a magnetic brush around an outer circumferential surface of a developing sleeve accommodating a magnet therein, by the use of a developer composed of high-resistivity magnetic toner having a resistance value of $10^{13}\Omega$cm or more under an electric field of 10^4 V/cm and a charge amount of 5 to 15 μQ/g per unit mass generated by gaseous discharge;

rubbing a surface of an electrostatic latent image carrier bearing said electrostatic latent image with said magnetic brush; and

applying simultaneously to said magnetic brush during said rubbing, an a.c. bias, and a d.c. bias approximately equal to a sum of a potential of an image portion of said electrostatic latent image and a potential of a non-image portion thereof.

4,376,814

CERAMIC DEPOSITION ON ALUMINUM

John E. Walls, Annandale, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 18, 1982, Ser. No. 359,455

Int. Cl.³ G03C *1/94;* B32B *9/06;* G03C *1/52*

U.S. Cl. 430—272 **19 Claims**

1. An article comprising an aluminum sheet, and a coating on said sheet, said coating comprising a composition produced by the method of

(a) admixing a compound selected from the group consisting of silicates, tetraborates and pentaborates having monovalent cations, with

(b) the product obtained by titrating an aqueous solution of one or more compounds selected from the group consisting of organic sulfonic, phosphonic, phosphoric and tribasic or higher functionality carboxylic acids with a monovalent alkali until an alkaline pH is attained provided said titration product is selected such that it does not form a precipitate with the compound of part (a).

9. The article of claim 1 or 8 further comprising a lithographically suitable photosensitive composition applied to said coating.

4,376,815

METHOD OF APPLYING PHOTORESIST BY SCREENING IN THE FORMATION OF PRINTED CIRCUITS

Michael J. Oddi, 64 Fairfax St., Burlington, Mass. 01803, and Alfred P. Orio, 26 River St., Westford, Mass. 01886

Filed Oct. 22, 1979, Ser. No. 87,223

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—313 **18 Claims**

1. In a method for the formation of a printed circuit comprising the steps of applying a layer of light sensitive photoresist material over a substrate, drying the photoresist material to form a dry layer, exposing the photoresist layer to activating radiation, developing the photoresist to form a relief image and permanently modifying the substrate in a desired printed circuit pattern, the improvement whereby said light sensitive photoresist is applied to said substrate by screening the same onto said substrate through a screen fabric in an incomplete circuit pattern.

4,376,816

METHOD FOR STORING SHEETS OF PHOTOTHERMOGRAPHIC SHEET MATERIAL

Yoshio Hayashi; Akira Onuma, and Tetsuo Shiga, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 25, 1981, Ser. No. 276,870

Claims priority, application Japan, Jul. 4, 1980, 55-91289

Int. Cl.³ G03C *5/24;* B65B *35/50;* B65D *85/48*

U.S. Cl. 430—347 **15 Claims**

1. A method for storing sheets of a photothermographic sheet material composed of a high molecular weight compound support and a sensitive emulsion comprising, as the indispensable constituents, an organic silver salt oxidizing agent, a reducing agent for silver ion, a photosensitive silver salt compound or its precursor, and a binder, characterized by inserting paper having smooth surfaces between every two sheets of said photothermographic sheet material.

4,376,817

DIRECT-POSITIVE PHOTOGRAPHIC MATERIAL

Rolf Steiger, Praroman, and Jean F. Reber, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

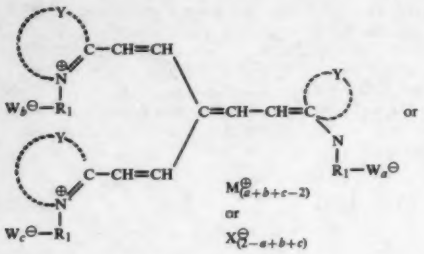
Continuation of Ser. No. 70,476, Aug. 28, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,323

Claims priority, application Switzerland, Sep. 1, 1978, 9254/78; Apr. 5, 1979, 3189/79; Apr. 5, 1979, 3190/79

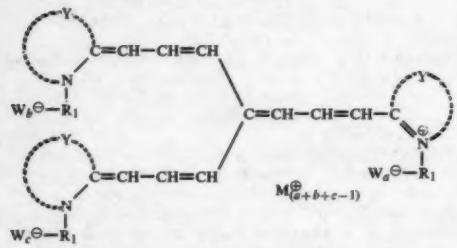
Int. Cl.³ G03C 1/10

U.S. Cl. 430—578 8 Claims

1. A direct-positive photographic material having at least one layer which contains a silver halide emulsion surface-fogged by chemical means or by exposure and a cyanine dye, wherein the dye has the formula



or



in which Y represents the atoms necessary to complete the mono- or poly-heterocyclic ring system, R_1 in each case is a substituted or unsubstituted alkyl having 1 to 20 carbon atoms, aryl or aralkyl (if $W^{\ominus}$ is not present), substituted or unsubstituted alkylene having 1 to 20 carbon atoms or substituted or unsubstituted aryl or aralkyl, $W^{\ominus}$ is a sulfo or carboxyl group, $M^{\oplus}$ is a monovalent cation, $X^{\ominus}$ is a monovalent anion and a, b and c are each the number 0 or 1, one of these indices being 1, said dye being present in an amount sufficient to increase the sensitivity of the emulsion in the long-wave regions of visible light.

4,376,818

NOVEL HARDENER FOR GELATIN AND METHOD FOR HARDENING GELATIN

Minoru Ohashi, and Katsuaki Iwaosa, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

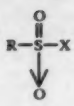
Filed Aug. 20, 1980, Ser. No. 179,784

Claims priority, application Japan, Aug. 31, 1979, 54/111581

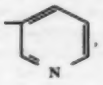
Int. Cl.³ C09H 7/00

U.S. Cl. 430—623 19 Claims

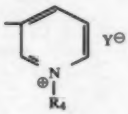
1. A process for hardening gelatin, characterized by reacting gelatin with a compound represented by the following general formula:



where R represents an alkyl or aryl group and X represents an oxy group represented by —O—R_1 wherein R_1 is a pyridyl group represented by



or a quaternary salt thereof represented by



these pyridyl group and quaternary salt thereof may be substituted with an alkyl, aryl, aralkyl, carboxyl or a group containing the same or a sulfo group or a group containing the same, $Y^{\ominus}$ is not present when they are substituted with a carboxyl group, sulfo group or group containing carboxyl or sulfo group, R_4 is an alkyl group or aralkyl group and when R_4 contains a sulfo group or carboxyl group, $Y^{\ominus}$ is not present and $Y^{\ominus}$ is an anion.

4,376,819

BIOLOGICAL EXTRACTS AND METHOD FOR MAKING SAME

R. Clark Brown, Round Lake Beach; Richard Cotter, Libertyville, and Susan K. Young, North Chicago, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 75,579, Sep. 14, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 236,963

Int. Cl.³ C12Q 1/00; 1/36, 1/38

U.S. Cl. 435—4 8 Claims

1. A method for inactivating inhibitor in coagulase-containing amebocyte extracts which comprises adjusting the pH of the extract above about 8.5 to inactivate the inhibitor, followed by lowering the pH to a level at which coagulase is active.

4,376,820

COMPOSITION SUITABLE FOR TESTING BIOLOGICAL TISSUES AND/OR LIQUIDS, AND THE METHOD OF USE

Ivo Giannini, and Vittorio Baroncelli, both of Rome, Italy, assignors to E.N.I. Ente Nazionale Idrocarburi, Rome, Italy

Division of Ser. No. 165,787, Jul. 3, 1980, Pat. No. 4,331,759. This application Feb. 23, 1982, Ser. No. 351,582

Claims priority, application Italy, Sep. 10, 1979, 25568 A/79

Int. Cl.³ G01N 33/50

U.S. Cl. 435—4 1 Claim

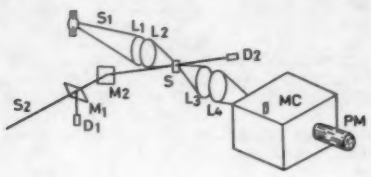
1. A method for testing biological tissues and/or liquids, consisting essentially of contacting biological tissue and/or liquid with a composition consisting essentially of a mixture of:

(a) a dye at a concentration of between 10^{-5} and 10^{-4} M and chosen from the xanthene, axine, oxazine or acridine

series, or from water-soluble dyes of the "diazo" series, or triphenylmethane,

(b) a medium compatible with said biological tissue and/or liquid, and

(c) a quencher substance which may be potassium iodide, sodium iodide or the salt of a paramagnetic transition metal and which is capable of de-energising the dye molecules when it encounters them said quencher substance



being present in said mixture at a concentration of from 10^{-2} to 0.2 M,

subjecting the so-treated biological tissue and/or liquid to radiation by a first beam of pulsated light, passing a second beam of monochromatic light through the biological tissue and/or liquid thus treated, and analysing the optical intensity of said second beam as a function of time after it has passed through said biological tissue and/or liquid.

4,376,821

PRODUCTION OF HUMAN IFN-GAMMA (IMMUNE) INTERFERON

Irwin A. Braude, Burke, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Filed Apr. 17, 1981, Ser. No. 255,138

Int. Cl.³ C12P *21/00*; C12N *5/00*

U.S. Cl. 435—68 **15 Claims**

1. A process for the production of human immune interferon comprising:

(a) providing a viable cell suspension containing approximately 1.0×10^6 to about 9.0×10^6 human peripheral blood leukocytes per ml;

(b) adding a modulator to said cell suspension said modulator being selected from the group consisting of mezerein and 12,13 phorbol dibutyrate in an amount of at least 0.7 ηg/ml. of said cell suspension;

(c) adding calcium ionophore A-23187 to said cell suspension such that a final amount ranging from about 0.1 to about 10.0 μg/ml of cell suspension is achieved;

(d) mixing said modulator and said inducer in said cell suspension to form a mixture;

(e) adding a protein supplement in an amount which results in a concentration of supplement sufficient to keep the cells alive;

(f) incubating said mixture under physiological conditions for a period of time sufficient to produce extractable yields of human immune interferon; and

(g) separating after incubation the cellular material of the cell suspension from the soluble fraction of the mixture, said soluble fraction containing a substantial portion of the produced human immune interferon and soluble contaminants.

4,376,822

PRODUCTION OF HUMAN IFN- γ (IMMUNE) INTERFERON

Irwin A. Braude, Burke, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Filed Apr. 17, 1981, Ser. No. 255,139

Int. Cl.³ C12P *21/00*; C12N *5/00*

U.S. Cl. 435—68 **13 Claims**

1. A process for the production of human immune interferon comprising:

(a) providing a viable cell suspension of RPMI 1640 culture medium containing approximately 1.0×10^6 to about 9.0×10^6 human peripheral blood leukocytes per ml;

(b) adding a modulator selected from the group consisting of mezerein and 12, 13 phorbol dibutyrate to said cell suspension in an amount of at least 0.7 ηg/ml. of said cell suspension;

(c) mixing said modulator in said cell suspension to form a mixture;

(d) incubating said mixture under physiological conditions for a period of time sufficient to thoroughly stimulate the cells;

(e) mixing *Staphylococcal aureus* enterotoxin B into said modulated mixture such that a final amount ranging from about 0.01 to about 10.0 μg/ml. of modulater cell suspension is achieved;

(f) incubating said modulated mixture under physiological conditions for a period of time sufficient to produce extractable yields of human immune interferon; and

(g) separating after incubation the cellular material of the cell suspension from the soluble fraction of the mixture, said soluble fraction containing a substantial portion of the produced human immune interferon and soluble contaminants.

4,376,823

METHOD OF INCREASING THE ANTIBIOTIC YIELD OF PRODUCING ORGANISMS

Bernard Weisblum, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jun. 18, 1981, Ser. No. 274,728

Int. Cl.³ C12P *19/62, 19/64*; C12N *15/00*; C12R *1/29, 1/365, 1/465, 1/54, 1/565*

U.S. Cl. 435—73 **10 Claims**

1. A method of increasing the yield of a desired product by an organism selected from Streptomyces, Micromonospora and Nocardia which organism produces that product but which normally must first become inducibly resistant to that product before it can produce the product in maximum yields, which method comprises producing constitutively resistant cells of the organism by supplementing a culture of the organism with an agent in which only cells able to specifically modify the 23S ribosomal RNA constitutively, rather than inducibly, survive thereby producing an organism in which the resistance to the product is expressed without the need for activation by the induction process; followed by purification and utilization of that organism for increased production.

4,376,824

PROCESS FOR PRODUCING GLUCOSE/FRUCTOSE SYRUPS FROM UNREFINED STARCH HYDROLYSATES

Louis S. Hurst, and Norman E. Lloyd, both of Clinton, Iowa, assignors to Nabisco Brands, Inc., New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,183

Int. Cl.³ C12P *19/24*

U.S. Cl. 435—94 **33 Claims**

1. A process for producing a glucose/fructose syrup comprising liquefying starch at a pH of less than about 6.0 and enzymatically saccharifying the liquefied starch under controlled conditions to provide an unrefined glucose-containing hydrolysate having present not more than about 100 ppm of calcium ions based on dry substance starch and wherein the

mole ratio of non-enzymatically generated ketose sugars is less than about 2 (moles per 100 moles of hexose units), treating the hydrolysate to remove non-starch material therefrom, and contacting the unrefined hydrolysate with immobilized glucose isomerase to convert at least a portion of the glucose to fructose.

4,376,825

ENZYME AMPLIFICATION COMPOUNDS FOR ASSAYS FOR ANDROGENS

Kenneth E., Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

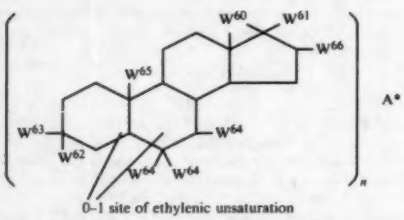
Division of Ser. No. 36,929, May 7, 1979, Pat. No. 4,282,325, which is a continuation-in-part of Ser. No. 857,145, Dec. 5, 1977, Pat. No. 4,203,802, which is a continuation-in-part of Ser. No. 802,683, Jun. 2, 1977, Pat. No. 4,190,496, which is a continuation of Ser. No. 760,499, Jan. 19, 1977, Pat. No. 4,191,613, which is a continuation-in-part of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Dec. 30, 1980, Ser. No. 221,235

The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.

Int. Cl.³ G01N *31/14*; L07G *7/02*

U.S. Cl. 435—188 **5 Claims**

1. An enzyme-bound-ligand of the formula:



0–1 site of ethylenic unsaturation

wherein:

any one of the W groups can be —X• or an H of any of the W groups may be replaced by —X•, wherein —X• is a bond or a linking group of from 1 to 8 carbon atoms, and from 1 to 4 heteroatoms;

A• is an enzyme bonded at other than its reactive site, having n ligands wherein n is in the range of 1 to the molecular weight of A• divided by 2,000;

W^{60} is hydrogen or hydroxyl;

W^{61} is hydrogen, methyl, or hydroxyl;

W^{62} and W^{63} are hydrogen or hydroxyl; with the proviso that at least one of W^{60-63} is hydroxy, or two of W^{60-63} are taken together to form oxo;

W^{64} is hydrogen, or two W^{64}'s are taken together to form a double bond;

W^{65} is methyl; and

W^{66} is hydrogen.

4,376,826

CONTINUOUS PRODUCTION OF BACTERIA FOR LEACHING OF METALLIC ORE

Roy L. Mynatt, 15362 DaCosta, Detroit, Mich. 48223

Filed Jun. 17, 1980, Ser. No. 160,285

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ C12N *1/20*; C10G *32/00*; C12M *1/14*

U.S. Cl. 435—253 **6 Claims**

1. A process for the production of bacteria suitable for the leaching of metallic ore comprising the steps of:

innoculating a pitted plate with a bacteria adapted to the leaching of metallic ore,

supplying a nutrient substrate to the bacteria sufficient to promote abundant growth of the bacteria desired,

periodically harvesting the bacterial growth extending above the pitted plate by passing a blade over the plate to shear off and collect the bacterial growth above the surface of the plate leaving behind the bacteria within the pits of the pitted plate, and,

conveying the products by sluice to the leaching site.

4,376,827

COMPOSITION, TEST DEVICE AND METHOD FOR DETERMINING THE IONIC STRENGTH OR SPECIFIC GRAVITY OF A LIQUID SAMPLE UTILIZING A STRONG POLYELECTROLYTE

Sisto N. Stiso, Elkhart, and Rodric H. White-Stevens, Howe, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 61,805, Jul. 30, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,269

Int. Cl.³ G01N *9/36*

U.S. Cl. 436—2 **22 Claims**

1. A composition capable of producing a detectable response indicative of the specific gravity of a liquid test sample, said composition comprising:

a strongly acidic or strongly basic polyelectrolyte polymer,

a buffer substance capable of providing a pH of at least about 5.5, and

a pH indicator compound.

4,376,828

BILIRUBIN TEST KIT

Patricia A. Rupchock, and Arthur C. Skjold, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 20, 1981, Ser. No. 294,570

Int. Cl.³ G01N *33/72*

U.S. Cl. 436—97 **11 Claims**

5. A method for determining the presence of bilirubin in a test sample comprising the steps of wetting a discrete point of a test mat comprising finely divided silica gel with a portion of the test sample, placing onto the wetted portion of the mat a reagent capable of producing a detectable response in the presence of bilirubin and causing the reagent to at least partially dissolve in a solvent and wet the test mat, and observing the appearance of the detectable response.

4,376,829

GLASS FOR USE IN MONOCHROMATIC COLORED LIGHT EMITTING CATHODE RAY TUBES

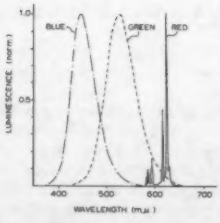
Nobutaka Daiku, Otsu, Japan, assignor to Nippon Electric Glass Company, Limited, Otsu, Japan

Filed Jun. 9, 1981, Ser. No. 272,038

Claims priority, application Japan, Jun. 12, 1980, 55-79916

Int. Cl.³ C03C *3/04*, *3/30*, *3/10*; C04B *35/68*

U.S. Cl. 501—64 **3 Claims**



1. Glass for use in a light-source cathode ray tube monochro-

matically emitting red or green light having the composition essentially consisting, in weight %, of 50–75% SiO_2, 0–5% Al_2O_3, 0–4% CaO, 0–2% MgO, 0–12% SrO, 0–16% BaO, 0–3% PbO, 0–3% ZnO, 0–3% ZrO_2, the sum of SrO+-BaO+PbO+ZnO+ZrO_2 being 1.5–25%, 0–4% Li_2O, 3–15% Na_2O, 1–10% K_2O, the sum of $Li_2O+Na_2O+K_2O$ being 5–24%, 0–2% TiO_2, 0.1–3% CeO_2, 1–10% Nd_2O_3, 0.5–5% Pr_2O_3 and 0.1–4% Fe_2O_3.

4,376,830

SULFUR CEMENT-AGGREGATE-ORGANOSILANE COMPOSITIONS AND METHODS FOR PREPARING

Edward L. Nimer, San Rafael, and Robert W. Campbell, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 10, 1981, Ser. No. 291,587

Int. Cl.[3] C04B *33/04*

U.S. Cl. 501—140 **18 Claims**

1. A composition which comprises sulfur cement and an aggregate which is contaminated with about from 1 up to 5 percent by weight of expansive clay based on the total weight of said aggregate, and an amount of an organosilane in the range of about from 0.027 to 0.15 weight percent, based on the total weight of said aggregate, effective to substantially reduce the water expandability of said expansive clay and wherein said organosilane has at least one molten-sulfur reactive group.

4,376,831

PHOSPHORIC ACID TREATED SULFUR CEMENT-AGGREGATE COMPOSITIONS

Gar L. Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1982, Ser. No. 364,570

Int. Cl.[3] C04B *33/04*

U.S. Cl. 501—140 **24 Claims**

1. A sulfur cement-aggregate composition, comprising sulfur cement, aggregate, and an amount of phosphoric acid effective to substantially improve the resistance of said composition to freeze-thaw degradation.

4,376,832

CATALYST-SOLVENT SYSTEM FOR POLYESTER-BASED POLYURETHANE FOAMS COMPRISING N-BUTYLMORPHOLINE AND N,N'-DIMETHYLPIPERAZINE AND THE SOLVENT

George P. Speranza, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,291

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—115 **20 Claims**

1. A catalyst-solvent system for use in reacting an organic polyisocyanate with an organic polyester polyol to produce a polyurethane, the catalyst-solvent system comprising catalytic amounts N-butylmorpholine and N,N'-dimethylpiperazine and a solvent of the formula

$$CH_3(CH_2)_n(O\underset{X}{\underset{|}{C}}H\underset{Y}{\underset{|}{C}}H)_mOH$$

where n is zero or greater, m is 1 or greater, X and Y are hydrogen or lower alkyl axcept that X and Y cannot both be lower alkyl.

4,376,833

COMPOSITION FOR PRODUCING SELF-SUPPORTING STIFF EXPANDED MATERIALS

Romeo Ferretti, Forli, Italy, assignor to Pro-Sac, S.p.A., Italy

Continuation-in-part of Ser. No. 60,699, Jul. 25, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,270

Int. Cl.[3] C08J *9/00*

U.S. Cl. 521—122 **18 Claims**

1. A composition for the production of stiff expanded self-supporting materials having a low K-factor and high mechanical strength, consisting essentially of:

A. 28–46 percent by weight of an unsaturated polyester resin containing at least about 25 percent by weight of styrene monomer;

B. 12–28 percent by weight of an organic diisocyanate;

C. 12–40 percent by weight of an inert anhydrous filler;

D. 0.5–2.5 percent by weight of an organic peroxide catalyst;

E. 4.8–11 percent by weight of a self-extinguishing compound; and

F. 0–6 percent by weight of styrene.

4,376,834

POLYURETHANE PREPARED BY REACTION OF AN ORGANIC POLYISOCYANATE, A CHAIN EXTENDER AND AN ISOCYANATE-REACTIVE MATERIAL OF M.W. 500-20,000 CHARACTERIZED BY THE USE OF ONLY 2-25 PERCENT BY WEIGHT OF THE LATTER MATERIAL

David J. Goldwasser, Cheshire, and Kemal Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 14, 1981, Ser. No. 311,198

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—159 **37 Claims**

1. A polyurethane characterized by high impact resistance, high flexural modulus, and a heat deflection temperature of at least 50° C. at 264 psi which comprises the product of reaction of

(a) an organic polyisocyanate;

(b) an isocyanate-reactive material having an average functionality of at least 1.9, a glass transition temperature (Tg) of less than 20° C., and a molecular weight in the range of about 500 to about 20,000; and

(c) at least one chain extender having a functionality from 2 to 3 and a molecular weight from about 50 to about 400;

said polyurethane being further characterized in that the proportion by weight of said isocyanate-reactive material (b) in said polyurethane is from about 2 to about 25 percent and the overall ratio of isocyanate groups to active hydrogen groups in said reactants employed to prepare said polyurethane is in the range of 0.95:1 to about 1.05:1.

4,376,835

CALCIUM DEPLETED ALUMINUM FLUOROSILICATE GLASS POWDER FOR USE IN DENTAL OR BONE CEMENTS

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, Hechendorf, and Oswald Gasser, Seefeld, all of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Praparate GmbH, Seefeld, Fed. Rep. of Germany

Continuation of Ser. No. 164,322, Jun. 30, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 336,850

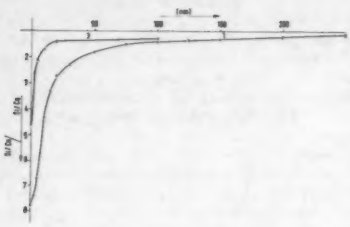
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2929121

Int. Cl.[3] A61F *1/00;* **B32B** *17/00, 17/06;* **C08L** *33/02*

U.S. Cl. 523—116 **30 Claims**

1. A calcium aluminum fluorosilicate glass powder reactable with a mixing fluid to form a self hardening glass ionomer cement exhibiting properties of reduced period of water sensitivity and at the same time insuring a sufficiently long processing period, said glass powder being characterized by particles having an average size of at least 0.5 microns, and in that the

level of calcium present at the surface of the powder particles is depleted relative to the level of the calcium present in the core region and to the extent that the quotient of the atomic ratio Si/Ca at the surface of the powder particles and the atomic ratio Si/Ca in the core region is at least 2.0, with the



calcium content increasing asymptotically from the surface to the core region.

18. A self-hardening glass ionomer cement comprising an aqueous mixture of the calcium aluminum fluorosilicate glass powder of claim **1** having a maximum particle size of 150 microns, a polycarboxylic acid and chelating agent.

4,376,836

TRIAZYLAMINOTRIAZINES, THEIR PREPARATION AND THEIR USE FOR STABILIZING SYNTHETIC POLYMERS

Hartmut Wiezer, Gersthofen, and Gerhard Pfahler, Augsburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

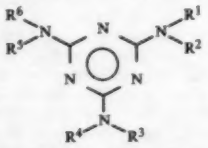
Filed Jul. 13, 1981, Ser. No. 282,504

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027223

Int. Cl.[3] **C08K** *5/34;* **C07D** *401/14, 401/12*

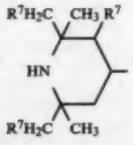
U.S. Cl. 524—100 **9 Claims**

1. Triazinylaminotriazines of the general formula (I)

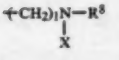


(I)

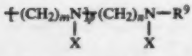
in which the radicals R^1, R^2, R^3, R^4, R^5 and R^6 are identical or different and denote C_1- to C_{18}-alkyl, C_5- to C_{12}-cycloalkyl, C_7- to C_{14}-aralkyl or a group of the formula (II), (III) or (IV)



(II)

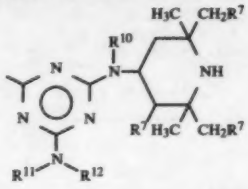


(III)



(IV)

but at least the radicals R^1, R^3 and R^5 represent a group of the formula (III) or (IV), and, in the formulae (II), (III) and (IV), R^7 denotes hydrogen or C_1- to C_5-alkyl, R^8 and R^9 denote identical or different radicals, which can be hydrogen, C_1- to C_{18}-alkyl, C_5- to C_{12}-cycloalkyl, C_7- to C_{14}-aralkyl or a group of the formula (II), l, m and n denote identical or different integers from 2 to 6, p denotes an integer from 1 to 3 and X denotes a radical of the formula



in which R^{10} and R^{11} represent identical or different radicals which can be hydrogen, C_1- to C_{18}-alkyl, which can be substituted by hydroxyl, C_1- to C_{18}-alkoxy or C_1- to C_4-dialkylamino, C_5- to C_{12}-cycloalkyl, phenyl, which can be substituted by C_1- to C_{18}-alkyl, or C_7- to C_{14}-aralkyl or a group of the formula (II), but, in said X, at least one radical R^{10} or R^{11} must be a C_2- to C_5-alkyl group which is substituted by C_1- to C_4-dialkylamino, and R^{12} is hydrogen, C_1- to C_{18}-alkyl, C_5- to C_{12}-cycloalkyl, C_7- to C_{14}-aralkyl or a group of the formula (II).

4,376,837

FLAME RETARDANT TETRABROMOPHTHALIC ACID ESTERS USEFUL IN SYNTHETIC RESINS

Herbert Jenkner, Pulheim, and Robert Strang, Cologne, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Cologne, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,849

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034634

Int. Cl.[3] **C08K** *5/15;* **C07D** *32/00;* **C07C** *69/80;* **C08K** *5/12*

U.S. Cl. 524—108 **7 Claims**

1. Tetrabromophthalic acid esters of pentabromobenzyl alcohol with a softening temperature of 270°–280° C. and a bromine content of 73–77% by weight.

2. Tetrabromophthalic acid esters of tetrakis(bromomethyl)-o-xylylene glycol with a softening temperature of 220°–230° C. and a bromine content of 62–68% by weight.

5. A flame retardant composition comprising a thermoplastic synthetic resin and an amount of the esters of claim **1** or **2** effective as a flame retardant.

4,376,838

CURED RUBBER SKIM STOCKS HAVING IMPROVED METAL ADHESION AND METAL ADHESION RETENTION BY USE OF ORGANO-METAL COMPLEXES AND HALOGENATED POLYMER

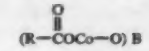
James A. Davis, Uniontown, and Robert C. Koch, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 18, 1981, Ser. No. 244,846

Int. Cl.[3] **C08K** *3/08, 5/09, 5/55;* **C08L** *9/00*

U.S. Cl. 524—184 **11 Claims**

1. In an improved cured rubber skim stock of conventional composition, bonded to at least one metal member contained in it, the improvement which comprises incorporating into said stock prior to curing a minor, but metal adhesion - promoting and - retaining amount of the combination of (a) about 5–30 phr of at least one halogenated polymer and (b) about 0.25–8.0 phr of at least one organo-cobalt or about 0.5–12 phr of organo-nickel complex, said halogenated polymer (a) being chlorobutyl rubber, bromobutyl rubber, fluorocarbon elastomer of specific gravity about 1.86, or chlorosulfonated polyethylene polymer containing about 43% chlorine and 1.0 to 1.1% sulfur and having a specific gravity of about 1.26 at 25° C., and said complex (b) being Manobond C represented by the general formula



wherein each R is an alkyl radical of from 9 to 12 carbons or organo carboxylate complexes of cobalt or nickel with aliphatic fatty acids having from 2 to about 20 carbon atoms.

6. A tire containing the cured rubber skim stock of claim 1 and having reinforcing metal members embedded therein.

4,376,839

HEAT STABLE, POLYMER-FORMING COMPOSITION

Michael J. Malin, Park Ridge, N.J., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jan. 21, 1980, Ser. No. 113,480

Int. Cl.³ C08K 5/36

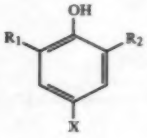
U.S. Cl. 524—303 14 Claims

1. A heat-stable, polymer-forming adhesive composition comprising:

(a) a polymerizable vinyl monomer containing at least one reactive double bond;

(b) a transition metal compound; and

(c) a polymer chain terminating antioxidant, said polymer chain terminating antioxidant being a p-alkoxyphenol of the formula:



wherein R_1 and R_2 are each selected from H, phenyl or t-butyl, and X is alkyl or alkyloxy, said alkyl group containing from 1 to 4 carbon atoms.

4,376,840

FLAME RETARDANT LIQUID RUBBER COMPOSITION

Toshimoto Moriwaki; Kiyoshi Hani; Shigeru Kubota; Shohei Eto; Akira Fukami, and Ichiro Yamasaki, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1980, Ser. No. 194,843

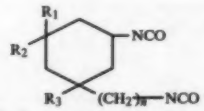
Claims priority, application Japan, Oct. 24, 1979, 54-137997; Nov. 29, 1979, 54-156531

Int. Cl.³ C08K 3/22; C08L 9/00

U.S. Cl. 524—779 6 Claims

1. A flame retardant liquid rubber composition comprising:

a hydrogenated polyhydroxybutadiene polymer and a castor oil which are modified with an isocyanate having the formula:



wherein R_1, R_2 and R_3 independently represent a lower alkyl group or hydrogen atom and n is an integer from 1 to 4,

alumina hydrate, and

magnesium hydroxide,

wherein said composition comprises 100 parts by weight of said hydrogenated polyhydroxybutadiene polymer, 10 to 150 parts by weight of said castor oil, 60 to 180 parts by weight of alumina hydrate, and 5 to 60 parts by weight of magnesium hydroxide.

4,376,841

COPOLYMERIZATION OF UNSATURATED POLYESTER RESINS

Lodewijk Roskott, Gorssel, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

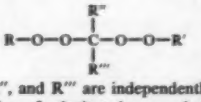
Filed Apr. 13, 1977, Ser. No. 787,123

Claims priority, application Netherlands, Apr. 26, 1976, 7604405

Int. Cl.³ C08F 4/36, 218/00; C08G 63/38

U.S. Cl. 525—23 10 Claims

1. An improved process for copolymerizing an unsaturated polyester resin which comprises an unsaturated polyester and a reactive monomer containing one or more polymerizable CH=C< groups, in which the improvement comprises performing said copolymerization in the presence of a peroxidic initiator comprising from about 0.1 to about 10 percent, by weight, calculated on the total weight of the resin, of a perketal having the structure



wherein R, R′, R″, and R‴ are independently selected from the group consisting of substituted or unsubstituted alkyl and aralkyl radicals, the alkyl and aralkyl radicals containing from about 4 to about 12 carbon atoms and R″ and R‴, along with the central carbon atom, being capable of forming a substituted or unsubstituted cycloalkyl group, and from about 0.001 to about 5 percent, by weight, calculated on the total weight of the resin, of an acid component which is an acid selected from the group consisting of (1) Bronsted acids having a $pK_a \leq$ formic acid, (2) Lewis acids, (3) metal halides having Lewis acid properties, and (4) acid forming compounds which upon being subjected to solvolysis, heating, or UV radiation, will release a Bronsted acid havng a $pK_a <$ formic acid, selected from the group consisting of triphenyl sulphonium chloride, benzoyl chloride, o-methyl benzoyl chloride, cumyl chloride, and 1,4-bis(α-chloroisopropyl)benzene.

4,376,842

NOVEL PEROXYKETALS DERIVED FROM ALKOXYACETONES

Wilhelmus M. Beyleveld, Olst, and Lodewijk Roskott, Gorssel, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

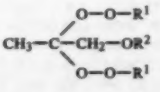
Division of Ser. No. 87,031, Oct. 22, 1979, Pat. No. 4,287,371, which is a continuation of Ser. No. 923,505, Jul. 10, 1978, abandoned. This application Feb. 12, 1981, Ser. No. 233,794

Claims priority, application Netherlands, Jul. 15, 1977, 7707887

Int. Cl.³ C08G 63/76

U.S. Cl. 525—27 7 Claims

5. A moulding composition comprising an ethylenically unsaturated monomer. an ethylenically unsaturated polyester, and a curing effective amount of a peroxyketal of the formula



wherein R^1 represents a tertiary alkyl group having 4–12 carbon atoms and R^2 a branched or non-branched alkyl group having 1–12 carbon atoms or a substituted or unsubstituted cycloalkyl group having 5–12 carbon atoms.

4,376,843

NOTCHED IMPACT RESISTANT VINYL CHLORIDE POLYMERS

Christian Lindner; Hans-Eberhard Braese, both of Cologne, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 5, 1981, Ser. No. 270,802

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022469

Int. Cl.³ C08L 51/04

U.S. Cl. 525—83 2 Claims

1. A notched impact resistant thermoplastic moulding composition of

(I) 1.0 to 99% by weight of a thermoplastic vinyl chloride polymer, and

(II) 99 to 1.0% by weight of a particulate graft polymer consisting of a core (a) of a highly cross-linked diene rubber, a first covering (b) of a cross-linked acrylate rubber, and a second covering (c) of a polymer or copolymer of at least one resin-forming monomer selected from the group consisting of styrene, α-methylstyrene, acrylonitrile, methacrylonitrile, acrylic acid esters and methacrylic acid esters.

4,376,844

HYDROCURABLE AMBIENT CURING POLYEPOXIDE COATING AND ADHESIVE COMPOSITIONS AND METHOD OF USING THEM

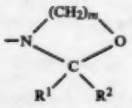
William D. Emmons, Huntingdon Valley, and Wayne E. Feely, Rydal, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 245,297, Mar. 19, 1981, Pat. No. 4,331,793, which is a division of Ser. No. 116,693, Jan. 30, 1980, Pat. No. 4,308,356. This application Jan. 20, 1982, Ser. No. 340,932

Int. Cl.³ C08G 59/50, 59/42

U.S. Cl. 525—117 12 Claims

1. An article of manufacture comprising a substrate having a cured surface coating thereon produced from a hydrocurable composition adapted to be used for coating, impregnating, or adhesive purposes at ambient conditions of temperature and relative humidity comprising an anhydrous mixture of (1) a resin-forming polyepoxide containing at least two vic-epoxy groups and (2) a polyfunctional compound containing at least two cyclic oxazolidinyl groups of the formula:



I(A)

wherein

m is 2 or 3, and

R^1 and R^2 are either separate alkyl groups, each having at least one carbon atom, or are joined directly together to form an alkylene group of 4 or 5 carbon atoms,

the compound (2) containing no other amine nitrogen groups, and the amount of (2) being sufficient to provide at least about one equivalent of epoxy group for each equivalent of amine in (1), the composition, in the absence of moisture, being stable for months, the coating being cured by exposure to ambient moist air at ambient temperature and having a relative humidity of at last 20%.

4,376,845

THREE-COMPONENT POLYMER BLENDS AND ADHESIVE FILMS PREPARED THEREFROM

Bruce A. Metzger, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1980, Ser. No. 215,600

Int. Cl.³ C08L 23/06, 23/08, 33/02

U.S. Cl. 525—196 20 Claims

1. A normally solid thermoplastic polymer blend composition comprising, based upon the total weight of said composition,

(a) from about 5 to 90 weight percent of a first adhesive resin having a melt index of from about 50 to about 700 and comprising a random copolymer of a major proportion by weight of ethylene and a minor proportion by weight of an ethylenically unsaturated carboxylic acid;

(b) from about 5 to about 90 weight percent of a normally solid second adhesive resin having a melt index of from about 3 to about 15 and comprising a random copolymer of a major proportion by weight of ethylene with a minor proportion by weight of an ethylenically unsaturated carboxylic acid; and

(c) from about 5 to about 70 weight percent of a normally solid non-adhesive resin having a melt index of from about 3 to about 10 and comprising a homopolymer of ethylene or a copolymer of a major proportion by weight of ethylene and a minor proportion by weight of a C_4–C_{12} α-olefin.

4,376,846

RUBBERY POLYMER BLENDS WITH ANILINO PHENYL UNITS

Teizo Kotani, Yokohama; Hiroji Enyo, Suzuka; Masaaki Watanabe, Hamamatsu, and Yasuhiko Takemura, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

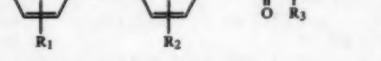
Filed Apr. 1, 1981, Ser. No. 250,038

Claims priority, application Japan, Apr. 3, 1980, 55-42860

Int. Cl.³ C08L 27/06, 9/02

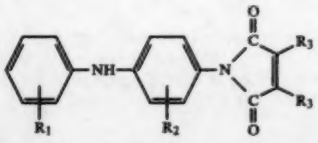
U.S. Cl. 525—205 10 Claims

1. A rubbery polymer composition comprising (A) a copolymer consisting of (1) 45 to 79% by weight of butadiene, (2) 20 to 55% by weight of acrylonitrile, and (3) 0.1 to 10% by weight of at least one compound selected from the group consisting of amide compounds represented by the formula:



(I)

wherein R_1 and R_2 individually represent hydrogen, chlorine, bromine, or alkyl having 1 to 12 carbon atoms; R_3 represents hydrogen, or alkyl having 1 to 4 carbon atoms; and R_4 represents hydrogen, alkyl having 1 to 4 carbon atoms, or aryl having 6 to 12 carbon atoms, and imide compounds represented by the formula:



(II)

wherein R_1, R_2 and R_3 are as defined above and two R_3's may be the same or different, and (B) a vinyl chloride polymer, which comprises polyvinyl chloride or a copolymer of vinyl

chloride and vinyl acetate, ethylene, propylene, butadiene or styrene, said copolymer having a vinyl chloride content of 60 mole% or more, the weight ratio of said (A) to said (B) being 95- 45 to 5- 60.

4,376,847

PROCESS FOR THE PRODUCTION OF STYRENE POLYMERS

Tetsuyuki Matsubara; Norifumi Ito; Yuzuru Ishida, and Mune Iwamoto, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,325

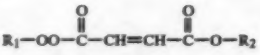
Claims priority, application Japan, Apr. 21, 1980, 55/51647

Int. Cl.³ C08F 112/04, 112/08, 279/02

U.S. Cl. 525—262 **10 Claims**

1. In a process for the production of styrene polymers wherein a styrene monomer or a styrene monomer having a rubber-like polymer dissolved therein is polymerized by bulk or solution polymerization using an organic peroxide as the catalyst, the improvement in which

(a) the organic peroxide is at least one compound of the formula



where R_1 and R_2 are the same or different radicals selected from the group consisting of hydrogen, alkyl radicals of from 1 to 5 carbon atoms, and phenyl;

(b) the polymerization is continuously carried out at a temperature not lower than 100° C. while the reaction mixture present in the polymerization zone is kept in such a mixed state as to make it substantially homogeneous; and

(c) the conversion of the styrene monomer into a polymer is controlled so as to fall within the range of from 20 to 90%.

4,376,848

WATER DILUTABLE CATHODIC DEPOSITABLE RESINOUS BINDER PRODUCTION AND USE

Arty R. T. Subramanyam, Wuppertal, and Manfred Schröder, Herdecke, both of Fed. Rep. of Germany, assignors to Lackwerke Wulfing GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,639

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014890

Int. Cl.³ C08L 74/04; C08G 71/04

U.S. Cl. 525—452 **18 Claims**

1. A method of producing water dilutable, cathodically depositable and thermosetting nitrogen-containing basic binders containing tertiary amino groups which comprises reacting a compound having at least one secondary amino group with a compound containing one epoxy group and one copolymerizable olefinic double bond and then copolymerizing the resulting product with at least one polymerizable monomer having an ethylenic double bond.

4,376,849

POLYADDUCT/POLYCONDENSATE CONTAINING BASIC NITROGEN GROUPS, ITS PREPARATION AND ITS USE

Fritz E. Kempter, Mannheim, and Eberhard Schupp, Schwetzingen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,891

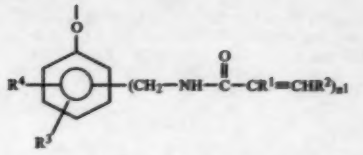
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026823

Int. Cl.³ C08G 8/30; C08L 63/00, 63/10

U.S. Cl. 525—490 **15 Claims**

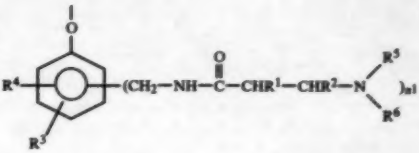
1. A polyadduct/polycondensate which is water-dilutable when protonated with an acid, which polyadduct/polycondensate is suitable for the cathodic electrocoating of metallic articles and which contains basic nitrogen groups, the groups being of the formula (I)

(I)



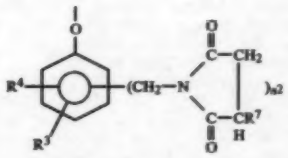
and/or of the formula (II)

(II)

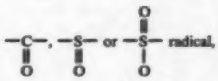


and which additionally contains groups of the formula (III)

(III)



in which formulae R^1 and R^2 are identical or different and each is hydrogen or methyl, R^3 and R^4 are identical or different and each is hydrogen, alkyl of 1 to 13 carbon atoms or a methylene, isopropylidene, —O—,



bonded to a phenol or a phenol-ether, R^5 and R^6 are identical or different and each is alkyl of 1 to 10 carbon atoms or hydroxyalkyl or alkoxyalkyl of 2 to 10 carbon atoms, or R^5 and R^6 are links to form a 5-membered or 6-membered ring, R^7 is a polydienyl radical, n^1 is from 0.5 to 3 and n^2 is from 0.05 to 1.0.

4,376,850

AQUEOUS PHASE POLYMERIZATION OF WATER MISCIBLE MONOMERS

James W. Sanner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1981, Ser. No. 264,492

Int. Cl.³ C08F 4/52

U.S. Cl. 526—196 **17 Claims**

1. A process for polymerizing water miscible monomers which process comprises (1) contacting an aqueous phase containing a water miscible monomer with an initiating amount of an initiator containing a metal borohydride and a metal ion that can be reduced by the borohydride and (2) subjecting the resulting aqueous phase to conditions of aqueous phase polymerization sufficient to polymerize the monomer to form a water-soluble polymer.

4,376,851

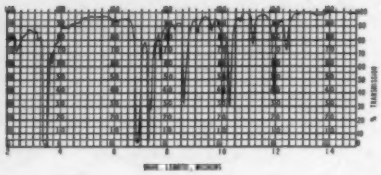
SOLID POLYMERS OF OLEFINS AND PRODUCTION OF SUCH POLYMERS

John P. Hogan, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 333,576, Jan. 27, 1953, abandoned, and Ser. No. 476,306, Dec. 20, 1954, abandoned. This application Jan. 11, 1956, Ser. No. 558,530

Int. Cl.[3] C08F *110/06*

U.S. Cl. 526—351 1 Claim



1. Normally solid polypropylene, consisting essentially of recurring polypropylene units, having a substantial crystalline polypropylene content.

4,376,852

PROCESS FOR PREPARING CELLULOSE PULP FILLER FOR THERMOSETTING RESIN MOLDING POWDERS

Sven G. Lindenfors, Domsjo, Sweden, assignor to Mooch Domsjo Aktiebolag, Ornskoldsvik, Sweden

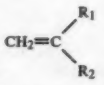
Filed May 1, 1981, Ser. No. 259,389

Claims priority, application Sweden, May 7, 1980, 8003406

Int. Cl.[3] C08F *251/02*

U.S. Cl. 527—314 35 Claims

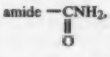
1. A process for preparing a graft polymer-modified cellulose pulp filler from cellulose sulfite pulp having an R_{18} value greater than 80%, which comprises adding to the pulp a redox initiator; washing the pulp with water having a pH below 5 in an amount sufficient to adjust the redox initiator cation content to within the range from about 5 to about 1000 ppm of cellulose sulfite pulp; adding hydrogen peroxide in an amount to provide within the range from about 0.1% to about 4% H_2O_2 by weight of the sulfite pulp; and then reacting the pulp with at least one monomer having the formula:



in which:

R_1 is hydrogen or methyl; and

R_2 is selected from the group consisting of nitrilo—CN,



and $COOR_3$ groups, wherein R_3 is selected from the group consisting of methyl, ethyl, n-butyl, isobutyl and 2-ethylhexyl;

at a temperature at which grafting of the monomer onto the cellulose polymer molecule proceeds but below about 70° C. for a time less than twelve hours under an inert atmosphere, the monomer being added in an amount sufficient to provide a grafting ratio within the range from about 1 to about 40% and an average degree of polymerization within the range from about 20 to about 4000; and then recovering the graft polymer-modified cellulose sulfite pulp.

4,376,853

PROCESSING OF GUAYULE MATERIAL BY VOLATILIZING AND HEATING STEPS

Richard Gutierrez, Canal Fulton, and Edward L. Kay, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 5, 1982, Ser. No. 355,080

Int. Cl.[3] C08G *83/00*; C08L *93/00*

U.S. Cl. 528—1 13 Claims

1. A method of processing guayule resinous material comprising the steps of:

(a)(i) processing guayule and/or related plants to provide resinous material;

(a)(ii) optionally, removing solvent from the resinous material to provide a resinous extract;

(a)(iii) optionally, recovering rubber from the resinous material or extract to leave a resin;

(a)(iv) optionally, adding an organic carrier to the resinous material, extract or resin to provide feed;

(b) volatilizing at least a protion of the resinous material, extract, resin, feed or a mixture thereof to provide vapor;

(c) heating the vapor (b) in a heating chamber at a temperature and pressure and for a time sufficient to cause a portion of it to fragment;

(d) removing the fragments from the chamber as effluent; and

(e) recovering the fragments from the effluent.

4,376,854

PROCESS FOR PREPARING RESORCINOL COPOLYMERS

Toyohiko Yamaguchi, Chiba; Koichi Kashima, and Nobuo Kaifu, both of Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

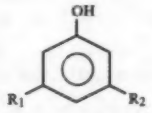
Filed Apr. 5, 1982, Ser. No. 365,790

Claims priority, application Japan, Apr. 10, 1981, 56/53024; Apr. 10, 1981, 56/53025

Int. Cl.[3] C08G *8/20, 8/22, 8/24*

U.S. Cl. 528—137 16 Claims

1. A process for preparing a resorcinol copolymer, comprising reacting at least one phenol having the general formula,



in which R_1 is $—CH_3$ or $—OCH_3$, and R_2 is hydrogen or $—CH_3$, with formaldehyde in an amount of 0.6 to 2.4 moles per mole of said phenol, in the presence of an alkaline catalyst, to obtain a resol-type precondensate containing 1 to 30%, based on the initial amount, of residual unreacted formaldehyde, and, then, adding said resol-type precondensate to a mixture of an acid, equivalent to said alkaline catalyst or 10 mol % excess with reference to said phenol, and at least one member selected from the group consisting of resorcinol and lower alkyl-substituted resorcinols, in an amount of 0.4 to 2.5 moles per mole of said phenol, to effect co-condensation.

4,376,855

EMULSIFIABLE ETHYLENE CONTAINING POLYOLEFIN WAXES HAVING IMPROVED EMULSIFIABILITY AND PROCESS FOR THEIR PREPARATION

William A. Ames, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,273

Int. Cl.[3] C08F *10/02, 255/02, 255/04*

U.S. Cl. 528—271 20 Claims

1. A process for preparing an emulsifiable ethylene contain-

ing low viscosity polyolefin wax having a saponification number of from about 30 to about 250 which comprises reacting low viscosity polyolefin waxes selected from the group consisting of polyethylene or ethylene/alpha-olefin copolymers containing from 99 to 50 percent by weight ethylene and at least one alpha-olefin monomer having from 3 to 12 carbon atoms and having a melt viscosity of about 5 to 6,000 cp. at 150° C. and having less than 0.1 percent unsaturation under a substantially inert atmosphere with an unsaturated polycarboxylic component and an amount of peroxide added incrementally during the reaction wherein the weight ratio of unsaturated polycarboxylic component to peroxide is about 1/1 to less than 5/1.

4,376,856

POLYETHER-ESTER AMIDE AND PROCESS FOR PREPARATION THEREOF

Chiaki Tanaka, Chita, and Shinobu Nakashima, Nagoya, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,760

Claims priority, application Japan, Nov. 25, 1980, 55/164726

Int. Cl.³ C08G *69/08, 69/44*

U.S. Cl. 528—292 **13 Claims**

1. A polyether-ester amide obtained by mixing an aminocarboxylic acid (A) having 6 to 20 carbon atoms, a poly(alkylene oxide)glycol (B) having a number-average molecular weight of 300 to 6,000 and a dicarboxylic acid (C) having 4 to 20 carbon atoms, heating the mixture without the addition of water, under normal pressure at 150° to 260° C. and then polymerizing the mixture at 220° to 300° C. under high vacuum, wherein the amino, carboxyl and hydroxyl groups in the mixture of the components (A), (B) and (C) satisfy the following requirement:

$$0.95 \leqq [COOH]/([NH_2]+[OH]) \leqq 1.05$$

and the amount of the component (B) is 5 to 90% by weight based on the total amount.

4,376,857

PHOSPHITE-ISOCYANURATE OLIGOMERS

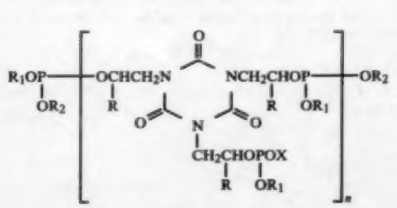
Leo L. Valdiserri, and Richard P. Woodbury, both of Belpre, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 3, 1981, Ser. No. 298,967

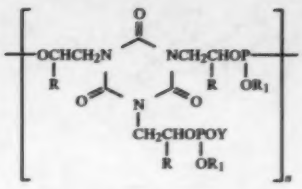
Int. Cl.³ C07D *403/12, 403/14*

U.S. Cl. 544—214 **7 Claims**

1. A phosphite-isocyanurate having the structure



wherein R is methyl or hydrogen, R_1 and R_2 are alkyl radicals of 10 or more carbon atoms, phenyl or alkylphenyl radicals of 10-22 carbon atoms, X is R_2 or



n is 2–10 and Y is R_2 or X.

4,376,858

2-4-DIAMINO-5-METHYL-6-[(3,4,5-TRIMETHOXYANILINO)METHYL]QUINAZOLINE SALTS

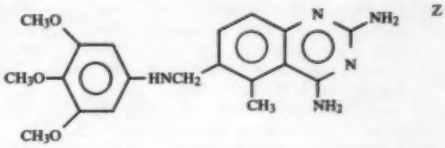
Norman L. Colbry, Gregory, Mich., assignor to Warner Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 202,512, Oct. 31, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 344,350

Int. Cl.³ C07D *239/84;* **A61K** *31/505*

U.S. Cl. 544—291 **5 Claims**

1. A compound of the formula



wherein Z is 2-hydroxyethanesulfonic acid or glucuronic acid.

4,376,859

PROCESS FOR THE PREPARATION OF ANILINE CONDENSATION DYESTUFFS

Werner Maurer, and Johann Zimmer, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 219,607

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1980, 3000529

Int. Cl.³ C07C *241/06;* **C09B** *17/00, 17/02, 57/00*

U.S. Cl. 544—348 **7 Claims**

1. In a process for the preparation of an aniline condensation dyestuff by reacting aniline and/or an alkyl aniline, batchwise, in cycles or continuously with nitrobenzene, which can be substituted, and/or diazoaminobenzene, with warming and in the presence of a catalyst, the improvement wherein the reaction mixture is worked up by continuously mixing the same with dilute hydrochloric acid and the dyestuff which has precipitated out is continuously filtered off.

4,376,860

PYRIDYL KETONE

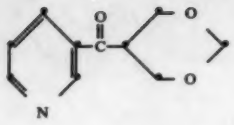
Richard N. Booher, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 27, 1981, Ser. No. 325,517

Int. Cl.³ C07D *405/06*

U.S. Cl. 546—268 **1 Claim**

1. The pyridylcarbonyldioxane of the formula



4,376,861

METHOD FOR PREPARING 2-ALKENYL-2-OXAZOLINES

James W. Lalk, Shepherd; Gerald C. Kolb, Bay City; Donald A. Tomalia, and Peter W. Owen, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 169,587, Jul. 17, 1980, abandoned, which is a continuation of Ser. No. 699,091, Jun. 23, 1976, abandoned. This application Dec. 3, 1981, Ser. No. 327,299

Int. Cl.³ C07D *263/12, 263/14*

U.S. Cl. 548—237 26 Claims

1. A method for preparing a 2-alkenyl-2-oxazoline comprising the steps of:

(A) reacting by contacting an anhydrous or substantially anhydrous 2-alkyl-2-oxazoline or inertly-substituted 2-alkyl-2-oxazoline with formaldehyde in a molar ratio of at least about 3 moles of 2-alkyl-2-oxazoline per mole of formaldehyde, thereby forming the corresponding 2-(α-hydroxymethylalkyl)-2-oxazoline,

(B) recovering the 2-(α-hydroxymethylalkyl)-2-oxazoline from the reaction product of step A, and

(C) reacting by contacting the 2(α-hydroxymethylalkyl)-2-oxazoline from step B with potassium or sodium hydroxide, thereby forming the 2-alkenyl-2-oxazoline.

18. A method of preparing a 2-(α-hydroxymethylalkyl)-2-oxazoline comprising reacting by contacting an anhydrous or substantially anhydrous 2-alkyl-2-oxazoline with formaldehyde in a molar ratio of at least about 3 moles of 2-alkyl-2-oxazoline per mole of formaldehyde.

4,376,862

3-AMINO-2-CYANO-3-(5-AMINO-3-ARYL-ISOXAZOLO-4-YL)-ACRYLIC ACID METHYL ESTER

Hans Junek, and Burkhard Thierrichter, both of Graz, Austria, assignors to Lonza Ltd., Gampel, Switzerland

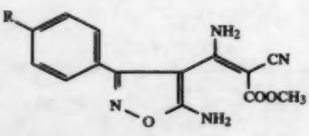
Division of Ser. No. 209,149, Nov. 21, 1980, Pat. No. 4,350,816. This application Nov. 25, 1981, Ser. No. 324,688

Claims priority, application Switzerland, Nov. 22, 1979, 10409/79

Int. Cl.³ C07D *261/14*

U.S. Cl. 548—249 1 Claim

1. 3-Amino-2-cyano-3-(5-amino-3-aryl-isoxazol-4-yl)-acrylic acid methyl ester having the formula:



(3)

wherein R (a) is —H, or (b) is —Cl or (c) is —CH_3.

4,376,863

HYPOCHOLESTEROLEMIC FERMENTATION PRODUCTS

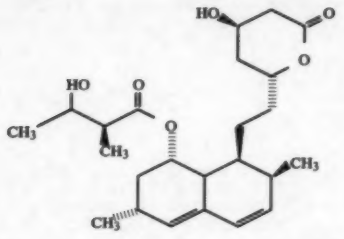
Tony Y. K. Lam, Edison, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 21, 1981, Ser. No. 295,187

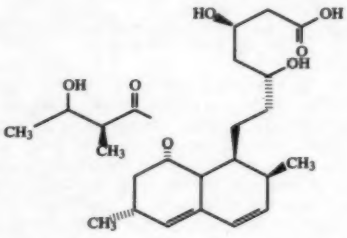
Int. Cl.³ C07D *309/30*; C07C *69/732, 59/46*

U.S. Cl. 549—292 1 Claim

1. A compound of structural formula I in substantially pure form:



I



II

or a pharmaceutically acceptable salt of compound II or a C_{1-3}alkyl ester of compound II or a substituted C_{1-3}alkyl ester of Compound II wherein the substituent is phenyl, dimethylamino, or acetylamino, all in substantially pure form.

4,376,864

CYCLIC ACETALS OF GLUTAMIC ACID-γ-SEMIALDEHYDE, PROCESS FOR THEIR PRODUCTION AND USE

Karlheinz Drauz, Freigericht; Axel Kleemann, and Marc Samson, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

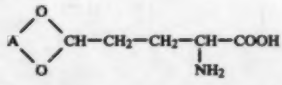
Filed Nov. 10, 1981, Ser. No. 320,131

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043159

Int. Cl.³ C07D *317/30, 319/06*

U.S. Cl. 549—373 1 Claim

1. A cyclic acetal of glutamic acid-γ-semialdehyde of the formula



(I)

in which A is an alkylene group with 2 to 3 carbon atoms or such an alkylene group substituted by 1 to 2 methyl groups.

4,376,865

PRODUCTION OF EPOXY COMPOUNDS FROM OLEFINIC COMPOUNDS

George J. Apanel, Bloomfield, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 35,560, May 3, 1979, Pat. No. 4,277,405. This application Mar. 13, 1981, Ser. No. 243,483

Int. Cl.³ C07D 301/26; C25B 3/02, 3/06

U.S. Cl. 549—521 25 Claims

1. In a process for producing an epoxy compound wherein a tertiary alkanol is chlorinated in the presence of an aqueous base to produce tertiary alkyl hypochlorite, the tertiary alkyl hypochlorite is contacted with an olefinically unsaturated compound and water to produce a reaction effluent containing water, tertiary alkanol and chlorohydrin, and the chlorohydrin is saponified with aqueous base to produce the corresponding epoxy compound, the improvement comprising:

extracting organics from the chlorohydrin production with an organic extraction solvent, said organics including the chlorohydrin and tertiary alkanol;

contacting organic extract containing chlorohydrin and tertiary alkanol, and an aqueous base to effect saponification of the chlorohydrin to the corresponding epoxy compound;

recovering the epoxy compound produced in the saponification;

separating from the saponification an organic solvent phase and an aqueous phase, said separation being effected with preferential extraction of the tertiary alkanol into the aqueous phase;

recycling organic solvent to said extracting of organic; and passing aqueous phase containing tertiary alkanol to the chlorination.

4,376,866

PROCESS FOR THE PREPARATION OF α-HYDROXYMETHYLENE ARYLACETIC ACID

Fritz Englaender, Bonn; Moustafa El-Chahawi, Troisdorf, and Wilhelm Vogt, Cologne, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,029

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103308

Int. Cl.³ C07C 69/76

U.S. Cl. 560—60 5 Claims

1. Process for the manufacture of alkyl esters of α-hydroxymethylene arylacetic acids, which comprises reacting the corresponding arylacetic acid alkyl ester, of the formula $R_1CH_2CO_2R_2$, in which R_1 is an aryl radical and R_2 is straight-chain or branched alkyl, with carbon monoxide in the presence of an alkali alcoholate.

4,376,867

CHEMICAL PROCESS

Gert Jansen, Bastholmen 16, DK-3520 Farum, and Per Wolff, 15A, DK-3460 Birkeroed, both of Denmark

Filed Jul. 7, 1981, Ser. No. 280,965

Int. Cl.³ C07C 51/15

U.S. Cl. 562—424 6 Claims

1. A process for preparing sodium salicylate which comprises reacting phenol with an aqueous solution of sodium hydroxide in a reaction zone to form sodium phenolate; heating the resulting reaction product mixture at elevated temperatures, which are raised to above about 175° C., to remove water therefrom; introducing carbon dioxide into the reaction zone while the thus produced sodium phenolate is maintained at an elevated temperature above about 175° C., and producing sodium salicylate directly in a single step by reaction between the sodium phenolate and carbon dioxide at said elevated temperatures.

4,376,868

ALKOXYLATION OF CRESYLIC ACIDS

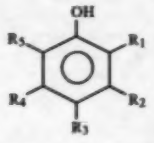
Gerald L. Nield; Kang Yang, and Paul H. Washecheck, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 14, 1980, Ser. No. 121,351

Int. Cl.³ C07C 51/00, 41/03

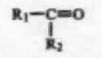
U.S. Cl. 562—465 10 Claims

1. A method for the alkoxylation of cresylic acids containing from about 6 to about 36 carbon atoms comprising contacting said cresylic acids with an alkoxylating agent at temperatures from about 120° C. to about 260° C. in the presence of basic barium-containing and strontium-containing materials selected from the group consisting of strontium metal, barium metal, strontium hydride, barium hydride, strontium oxide, barium oxide, strontium hydroxide, barium hydroxide, strontium hydroxide.XH_2O and barium hydroxide.XH_2O wherein X represents the number of water molecules present, and wherein the cresylic acids are a phenolic compound or a mixture of phenolic compounds having the general formula



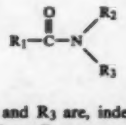
wherein R_1, R_2, R_3, R_4, and R_5 are, independently, hydrogen, linear or branched acyclic groups, alicyclic groups, cyclic groups, aryl groups, substituted aryl groups, halogen, hydroxyl, nitro, or carbonyl and wherein in addition the R-designated groups can contain one or more functionalities selected from the group consisting of halogen, nitro, carboxyl, carbonyl, amine, amide, or hydroxyl and wherein in addition from about 0.1 to about 2.0 weight percent by weight based on the weight of cresylic acid of a catalyst promoter or mixture of catalyst promoters is used, wherein the catalyst promoter is selected from the group consisting of

(a) aldehyde and ketone promoters containing one or more carbonyl containing compounds of the general formula



wherein R_1, and R_2 are, independently, linear or branched acyclic groups, alicyclic groups, cyclic groups, aryl groups, or hydrogen, and wherein the R-designated groups in addition can contain one or more functional groups selected from the group consisting of hydroxyl, carboxyl, carbonyl, amine, nitro or halogen;

(b) amide promoters containing one or more amide containing compounds of the general formula



wherein R_1, R_2, and R_3 are, independently, hydrogen, linear or branched acyclic groups, alicyclic groups, cyclic groups or aryl groups and wherein the R-designated groups can in addition contain one or more functional groups selected from the group consisting of hydroxyl, carboxyl, carbonyl, amine, nitro or halogen;

(c) amine promoters containing one or more amine containing compounds of the general formula

wherein R_1, R_2, and R_3 are, independently, hydrogen, linear or branched acyclic groups, alicyclic groups, cyclic groups, or aryl groups, and wherein the R-designated groups can in addition contain one or more functional groups selected from the group consisting of hydroxyl, carbonyl, halogen, carboxyl, nitro, or amide;

(d) organic acid promoters containing one or more carboxylic acid containing compounds of the general formula

wherein R_1 is a hydrogen, linear or branched acyclic group, alicyclic group, cyclic group, or aryl group and wherein R can in addition contain one or more functional groups selected from the group consisting of carbonyl, hydroxyl, halogen, nitro, amine, or amide.

4,376,869

PROCESS FOR THE PREPARATION OF TRIARYLBORANES

Robert F. McCartney, Wilmington, Del., and Nicholas Nazarenko, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 173,098, Jul. 28, 1980, Pat. No. 4,348,300. This application Sep. 24, 1981, Ser. No. 305,184

Int. Cl.³ C07F *5/02*

U.S. Cl. 568—1 **2 Claims**

1. In a process for the preparation of triarylboranes by reacting an alkali metal, an aryl halide and an orthoborate ester in an inert organic solvent wherein the alkali metal is introduced as a dispersion of finely divided particles in an inert organic liquid the improvement of preventing agglomeration of the said dispersion which consists essentially of introducing at least about 2.5% by weight based upon the weight of the alkali metal of an aryl halide into the said dispersion before contaeting the dispersion of alkali metal with the other reactants.

4,376,870

OPTICALLY ACTIVE PHOSPHINE COMPOUNDS

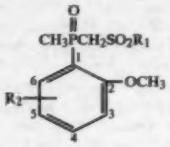
William C. Christopfel, Oakland, Calif., and William S. Knowles, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 5, 1980, Ser. No. 213,272

Int. Cl.³ C07F *9/50, 9/53*

U.S. Cl. 568—15 **8 Claims**

1. An optically active phosphine oxide of the formula



wherein R_1 is an alkyl, aryl or dialkylamino radical; R_2 is hydrogen or an alkyl, aryl, Cl, Br, I, F or sulfone radical; any of said alkyl and aryl radicals may be substituted with Cl, Br, I, F and/or sulfone radicals; R_2 is in the 3, 4 or 5 position; and R_1 and R_2 do not interfere with the necessary solubility properties or with the catalytic process.

4,376,871

METHOD FOR PURIFICATION OF CYCLOPENTENOLONES

Fumio Fujita, Ibaraki, Japan, assignor to Sumitomo Chemical Co., Limited, Osaka, Japan

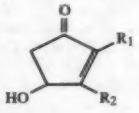
Filed Apr. 27, 1982, Ser. No. 372,379

Claims priority, application Japan, Apr. 30, 1981, 56-66682

Int. Cl.³ C07C *45/85*

U.S. Cl. 568—366 **6 Claims**

1. A method for purifying cyclopentenolone comprising reacting a cyclopentenolone of the formula (I),



(I)

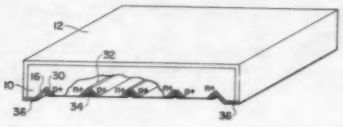
(wherein R_1 represents a C_{1-4} alkyl, C_{3-4} alkenyl, C_{3-4} alkynyl or phenyl C_{1-4} alkyl group, and R_2 represents hydrogen atom or a C_{1-4} alkyl group), with calcium chloride, separating the formed cyclopentenolone-calcium chloride complex from the reaction mixture, and decomposing the complex with water to obtain the purified cyclopentenolone.

4,376,872

HIGH VOLTAGE V-GROOVE SOLAR CELL

John C. Evans, Ravenna; An-Ti Chai, N. Ridgeville, and Chandra P. Goradia, Cleveland, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 219,678, Dec. 24, 1980, Pat. No. 4,335,503.
This application Mar. 18, 1982, Ser. No. 359,388
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—249 8 Claims



1. A high voltage multijunction solar cell of the type having a plurality of discrete voltage generating regions connected together; said solar cell comprising

a single semiconductor body of one conductivity type having oppositely disposed surfaces,

a plurality of V-shaped grooves in one of said surfaces, each of said grooves being short of and spaced from the oppositely disposed surface and including first and second faces angularly disposed to each other,

first doped regions of a first conductivity type in said first faces,

second doped regions of a second conductivity type opposite said first conductivity type in said second faces,

gap regions consisting essentially of undiffused regions of said semiconductor body located between pairs of oppositely disposed doped regions of adjacent grooves,

said gap regions providing electrical isolation means between adjacent unit cells,

said pairs of oppositely disposed doped regions defining voltage generating unit cells, and

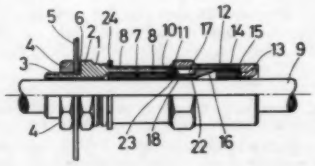
means for connecting together adjacent ones of said unit cells so that their output voltages are additive.

4,376,873

CABLE GLAND FOR USE WITH UNARMORED ELECTRICAL CABLES

Franz Lackinger, 9 Sligo Rd., Kenmare Krugersdorp, Transvaal Province, South Africa

Filed May 7, 1981, Ser. No. 261,607
Int. Cl.³ H05K *5/02*
U.S. Cl. 174—65 SS 14 Claims



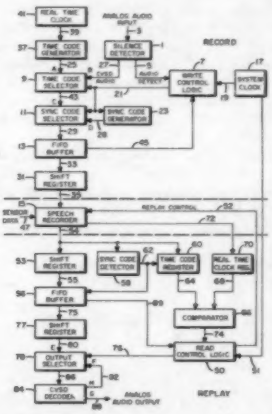
1. An electrical cable gland comprising a pair of tubular body members defining a passage for an electrical cable therethrough, means on one of the body members for connecting the gland to an electrical connection box, a portion of said passageway having an enlarged internal diameter and receiving within said portion at least one tubular flame-proofing seal adapted to be compressed axially by relative movement between the two body members to cause the seal to be urged radially inwardly into firm contact with the outer sheath of a cable passing therethrough in use; a deformable clamping ring also located within said portion of the passage and adapted likewise to be compressed axially to cause it to clamp radially inwardly onto another portion of the outer sheath of an electrical cable passing therethrough, the tubular flame-proofing seal being appreciably softer than the clamping ring to ensure effective flame-proofing of the gland prior to function of the clamping ring upon movement of the two body parts towards each other to shorten the effective length of the said enlarged portion of the passage therethrough, and an intermediate axially movable member located between the flame-proofing seal and clamping ring, the intermediate member being held captive by, but rotatable relative to, one of the body members.

4,376,874

REAL TIME SPEECH COMPACTION/RELAY WITH SILENCE DETECTION

Steven H. Karban, Apple Valley; James V. Drexler, St. Paul, and Cleon L. Hennen, Burnsville, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,031
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—15.55 T 15 Claims



1. A method for compacting and recording an analog signal in real time, comprising the steps of:

distinguishing silent periods from audio periods in a received said analog signal;

first recording a sync code indicative of the start of said audio periods, upon the detection of each said audio period;

second recording a time code indicative of the total elapsed real time since the initialization of the steps of this method of a compacting system; upon detection of each said audio period; and

third recording only the analog signal present during said audio periods;

whereby the amount of storage media necessary to store said analog signal can be minimized; and

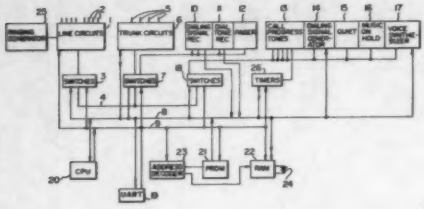
whereby said analog signal can be recorded with reference to said total elapsed real time.

4,376,875

KEYLESS AND INDICATORLESS LOCAL TELEPHONE SWITCHING SYSTEM

Patrick R. Beirne, Stittsville, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Nov. 10, 1980, Ser. No. 205,255
Claims priority, application Canada, May 16, 1980, 352147
Int. Cl.³ H04M 3/42
U.S. Cl. 179—18 B 11 Claims



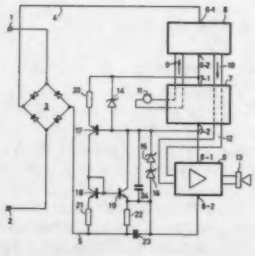
8. A telephone switching system comprising:
(a) a control system,
(b) means for connecting a plurality of subscribers'line circuits to the control system,
(c) means for connecting a plurality of trunk circuits to the control system,
(d) a set of junctors for interconnecting lines and trunks under control of the control system,
(e) means for indicating to an accessing subscriber that a specific trunk is being held, and
(f) means for interconnecting a line to said held designated trunk via a junctor and for releasing the held condition of said trunk upon receipt by the control system of a dialling signal from the line formed of a predetermined digit specifically designative of said held trunk.

4,376,876

DC SUPPLY FOR AN ELECTRONIC SIGNALLING DEVICE

Gijsbert W. Versteeg, Hilversum, Netherlands; Ian Phillips, Sherston near Malmesbury, England, and Eilev Enggrav, Oslo, Norway, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,114
Claims priority, application United Kingdom, Sep. 17, 1979, 7932109
Int. Cl.³ H04M 19/00
U.S. Cl. 179—77 2 Claims



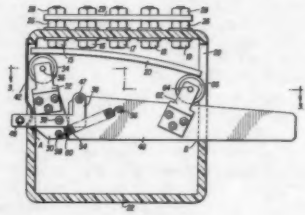
1. An electronic signalling device which may be used with a loudspeaker telephone set and which is connected to a signal transmission line over which a DC-supply current is applied to the device, said signalling device comprising:
a plurality of circuit units each comprising a pair of supply terminals for receiving DC supply current the supply terminals of at least two of said circuit units being connected such that said supply current flows in series through the circuit units and the supply voltage of one circuit unit adds to the supply voltage of at least one other of said circuit units, and
switching means for causing a substantial portion of said DC supply current to bypass at least one of said circuit units when said DC supply current decreases to below a threshold value.

4,376,877

MULTIPOSITION SWITCH

Melvin H. Decker, 7242 John Paul Dr. #102, Alexandria, Va. 22306

Filed Jul. 10, 1981, Ser. No. 282,323
Int. Cl.³ H01H 1/20
U.S. Cl. 200—1 B 9 Claims



1. A multiposition switch comprising:
a plurality of fixed contacts;
an arcuately shaped elongated movable contact;
means for applying a force to said movable contact proximate a first end thereof to urge said movable contact toward said fixed contacts; and,
actuator means for applying a force to said movable contact proximate a second end thereof to rock said movable contact across said plurality of contacts;
said movable contact being freely supported between said plurality of contacts on one side and said actuator means and said means for applying a force on the other side whereby said movable contact requires no permanent connection to either of the means for applying a force thereto.

4,376,878

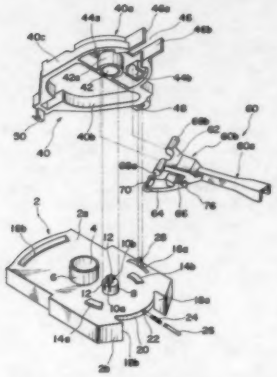
SWITCH ASSEMBLY FOR USE IN VEHICLE

Masayosi Iwata, Hashima; Kenshi Furuhashi, Nagoya, and Tadashi Yokoyama, Kuwana, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jul. 20, 1981, Ser. No. 284,537
Claims priority, application Japan, Jul. 22, 1980, 55-103589[U]
Int. Cl.³ H01H 3/16
U.S. Cl. 200—61.27 9 Claims

1. A switch assembly for use in vehicle comprising:
a plate-like body for being fixedly connected to a chassis of the vehicle, said plate-like body having first and second faces opposite to each other and a side face;
a projection extending perpendicularly from said first face of said plate-like body;
a pin mounted on said side face for movement inwardly and outwardly from said plate-like body in a radial direction to the axis of said projection and spring means engaged with said pin and biasing said pin outwardly;
a rotatable member having an opening therein in which said projection is engaged for rotatably mounting said rotatable member on said plate-like body, said rotatable member also having a first actuating means;
a lever having one end bifurcated to define first and second

arms, said first arm being pivotally mounted on said rotatable member for pivotal movement in a direction perpendicular to the direction of rotation of said rotatable member, and for rotation together with the rotation of said rotatable member about said projection, and said second arm extending along said second face of said plate-like body and having a second actuating means, said lever having a plurality of vertical and horizontal notches in a form of mesh and defining a plurality of tapered recesses on a surface of said lever between said first and second



arms, said pin being in the respective ones of said tapered recesses to hold the lever in rotated and pivoted positions;

first switch means mounted on said plate-like body and being engaged by said first actuating means for being actuated by said first actuating means as said rotatable member rotates; and

second switch means mounted on said plate-like body and being engaged by said second actuating means for being actuated by said second actuating means as said lever pivots.

4,376,879

BUTTON-LESS PUSH SWITCH BOARDS

Masumi Nagata; Fumiyoshi Kushima, both of Tokyo; Takeo Matsushima; Yasuhiro Fujioka, both of Toyota; Yasuhiro Iwata, Aichi, and Teiichi Nabeta, Okazaki, all of Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,044

Claims priority, application Japan, Oct. 28, 1980, 55-152993[U]

Int. Cl.³ H01H *9/16*

U.S. Cl. 200—314 **18 Claims**

1. A button-less push switch board having a plurality of push switches which comprises:

insulator plate means having a plurality of holes penetrating therethrough at predetermined locations on the main surface thereof where said switches are to be disposed;

cover plate means of a light transparent flexible sheet material mounted on said insulator plate means to cover said main surface, said cover plate means having identification marks of respective switches at locations corresponding to said holes of of said insulator plate means;

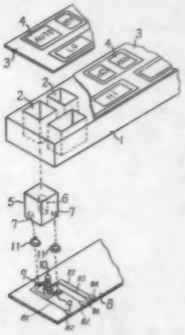
printed circuit plate means affixed to said insulator plate means to cover the reverse surface thereof and having at least one pair of adjacent fixed contact electrodes thereon at each location corresponding to each hole of said insulator plate means, and terminals connected through leads to said contact electrodes;

light transparent body means fitted slidably in said holes of said insulator plate means;

means for elastically supporting respective transparent body means so that the top end surface thereof comes into contact with said cover plate means and permitting respective transparent body means to be pushed down towards said circuit plate means in response to pushing of the area of said cover plate means corresponding to the body means;

at least one movable contact means supported on the bottom surface of each transparent body means for short-circuiting said at least one pair of contact electrodes when said transparent body means is pushed down; and

a plurality of light emitting means mounted on said printed circuit plate means and disposed in respective holes of said insulator plate means, each light emitting means being connected to terminals formed on said printed circuit plate means which are to be connected to an external drive circuit, whereby each light emitting means is illuminated in response to shortcircuiting of each pair of fixed



contact electrodes by the corresponding movable contact electrodes by pushing of said cover plate means, said printed circuit means having two pairs of said fixed contact electrodes at each location corresponding to each hole of said insulator plate, and two pairs of fixed contact electrodes being disposed at both sides of said light emitting means disposed in the hole, said movable contact means comprising two movable contact electrodes supported by said light transparent body means disposed in the hole, each of said light transparent body means including two of said elastically supporting means affixed to the bottom surface thereof, each of said elastically supporting means comprising a cup-like member of elastic material having a bottom portion affixed to the bottom surface of said light transparent body means and an open edge portion in contact with said printed circuit plate means, each of said movable contact electrodes being mounted on the inner bottom surface of each cup-like member.

4,376,880

METHOD OF AND APPARATUS FOR DETECTING GAP CONDITIONS IN EDM PROCESS WITH MONITORING PULSES

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation of Ser. No. 860,164, Dec. 13, 1977, Pat. No. 4,236,057. This application Jan. 16, 1980, Ser. No. 112,460

Claims priority, application Japan, Dec. 14, 1976, 51-150052; Jan. 12, 1977, 52-2806; Feb. 8, 1977, 52-13451; Feb. 16, 1977, 52-15889; Feb. 22, 1977, 52-18484; Mar. 8, 1977, 52-25066

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

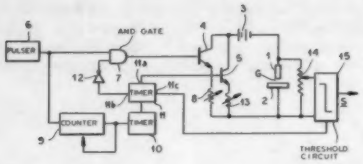
Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 M **15 Claims**

1. A method of detecting gap conditions in an EDM process, which comprises the steps of:

(a) applying across a machining gap a succession of machining voltage pulses resulting in machining current pulses having a pulse duration and peak current preselected to attain a predetermined machining consequence;

(b) interposing into said succession a plurality of monitoring voltage pulses each time-spaced and independent from adjacent said machining voltage pulses, said monitoring voltage pulses being capable of ionizing said gap and thereby effecting in the gap respective monitoring electrical discharges having individually a pulse duration and peak current preselected independently from said machining current pulses;



(c) measuring a characteristic of said monitoring electrical discharge, thereby classifying it into one of at least two categories; and

(d) ascertaining the gap condition in response to the result of step (c), each of said machining voltage pulses having its leading edge time-spaced from the trailing edge of the monitoring voltage pulse which precedes each said machining voltage pulse, each of said monitoring voltage pulses having its leading edge time-spaced from the trailing edge of the machining voltage pulse which precedes each said machining voltage pulse.

4,376,881

METHOD OF ELECTROSLAG WELDING WITH A PLATE ELECTRODE

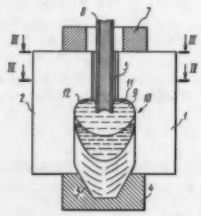
Anatoly N. Safonnikov, ulitsa Filatova, 1/22, kv. 78, and Anatoly V. Antonov, Brovarskoi prospekt, 71, both of Kiev, U.S.S.R.

PCT No. PCT/SU79/00032, § 371 Date Jan. 29, 1981, § 102(e) Date Dec. 23, 1980, PCT Pub. No. WO80/02664, PCT Pub. Date Dec. 11, 1980

PCT Filed May 29, 1979, Ser. No. 227,047

Int. Cl.³ B23K *25/00*

U.S. Cl. 219—73.1 **6 Claims**



1. A method of electroslag welding with a plate electrode, including the steps of positioning component parts to be welded with a gap between the component parts; introducing a plate electrode into the gap; and melting the electrode and the edges of the component parts by the heat of electrically heated slag to establish an upwardly moving welding bath, the side portions of the surface of the welding bath being formed under movable shoulders of non-molten metal, said shoulders forming during the course of melting of the edges of the component parts, wherein the improvement comprises the component parts to be welded being brought together to form a gap between the component parts such that the area "B" of the gap relates to the area "A" of the horizontal cross-section of the electrode and to the area "C" of the projection of the surface of the welding bath to the a horizontal plane as A:B:C = 1:(1.2 to 1.5):(2.5 to 4.5) to maintain an angle of deflection of the welding bath within the range of 0° to 15° in relation to the horizontal plane with the the movable shoulders limiting the vertical movement of the side portions of the surface of the welding bath, which side portions amounting to 40 to 75% of the area of the surface of the welding bath, and with a magnetic field of the electrode.

4,376,882

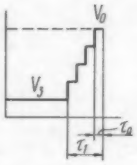
METHOD OF RESISTANCE FLASH BUTT WELDING

Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1, kv. 47; Boris I. Kazimov, ulitsa Kotovskogo, 11, kv. 20; Vasily F. Zagadarchuk, Kharkovskoe shosse, 2, kv. 232; Vasily A. Sakharnov, ulitsa Solomenskaya, 41, kv. 93, and Vitaly T. Cherednichok, Zadorozhny pereulok, 6, kv. 41, all of, Kiev, U.S.S.R.

Filed Aug. 5, 1980, Ser. No. 175,685

Int. Cl.³ B23K *11/04*

U.S. Cl. 219—100 **2 Claims**



1. In a method of resistance flash butt welding of metal workpieces of more than 5 mm in thickness, comprising the steps of feeding the metal workpieces together, applying a welding voltage to achieve flashing, said metal workpieces being heated to fusion, and upsetting said metal workpieces; the improvement wherein said feeding step comprises initially feeding the surfaces of the metal workpieces at a constant speed of feeding, and then, prior to upset, increasing the speed of feeding from said constant speed of feeding to a higher final value of speed of feeding for a period of time having a duration of $(\Delta max/v_1)$, where Δmax is a maximum gap found between the surfaces of the metal workpieces before the increase in speed of feeding, and v_1 is the average speed of feeding the workpieces over the period of increased speed of feeding.

4,376,883

MONITORING WELD QUALITY VIA FORGING ASSEMBLY DYNAMICS

Tan K. Dao, Chicago; Vance B. Gold, Lombard; Edward F. Kubacki, Marengo, and Walter J. Sieverin, McHenry, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 30, 1980, Ser. No. 173,724

Int. Cl.³ B23K *11/06*

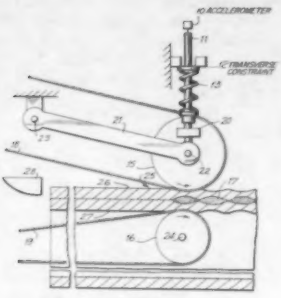
U.S. Cl. 219—109 **9 Claims**

1. A method of measuring the relative quality of a resistance pulse welding operation on a thin metallic can body side seam including the following steps:

transporting said side seam between a pair of electrodes for welding at a prescribed rate of speed while energizing the electrodes with a pulsing power supply and mechanically forcing them toward one another,

measuring the relative acceleration of one of said electrodes

in a direction normal to the movement of said seam between said electrodes to determine the relative quality of



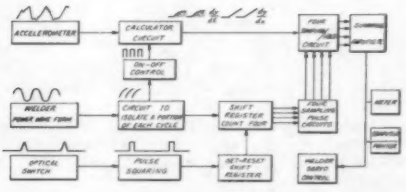
the resistance pulse welded seam by changes in the acceleration.

4,376,884

CLOSED LOOP CONTROL OF CONTINUOUS SEAM RESISTANCE HEATED FORGE WELDING CYLINDERS

Vance B. Gold, Lombard; Edward F. Kubacki, Marengo, and Thomas Krewenka, Prospect, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 30, 1980, Ser. No. 173,761
Int. Cl.³ B23K 11/06
U.S. Cl. 219—109 11 Claims



1. A circuit for monitoring weld quality in an electrical resistance heating forge welding process including:

(a) welding means for providing welding electrical energy and mechanical force to a juncture to be welded;

(b) an accelerometer transducer operatively associated with said welding means and held against at least one surface of the materials forming said juncture for movement therewith to provide a signal response in the form of a seriatum instantaneous outputs related to changes due to said process which influence the various portions of said accelerometer transducer signal;

(c) electronic calculating means connected to receive said accelerometer transducer signal response for conditioning same so that said accelerometer transducer signal response is enhanced and compared with a standard for issuing an output with respect to the difference from said standard, and

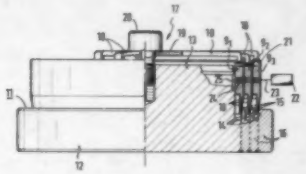
(d) control means responsive to said compared difference output and connected to operatively regulate performance varying parameters of said welding means.

4,376,885

PROCESS AND APPARATUS FOR PRODUCING A RING UNIT FOR THE VALVE PARTS OF LABYRINTH VALVES

Johannes R. Smirra, Wunderlichstr. 2, 8000 München 60, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,653
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950778
Int. Cl.³ B23K 15/00
U.S. Cl. 219—121 EC 9 Claims



1. In a process for making a ring unit for a cone labyrinth valve, said ring unit having at least two rings of which each has a blade-like edge, and being designed for use with a like ring unit in said valve for control of fluid motion by decreasing the distance between said units towards each other so that at least one blade-like edge of one said unit is between two ones of said edges on the other said unit causing fluid motion along a complexly folded path, the invention residing in the working steps of:

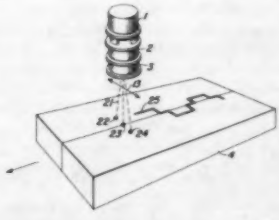
firstly producing blade-like edges on rings with cylindrical faces, making up a workpiece by placing such rings together one inside the other with an outer face of at least one ring touching the inner face of an other ring placed round it; moving said workpiece towards a jig with ring-like blades answering to the form of said ring unit with which the rings in said workpiece are to be used in said valve so that said rings in said workpiece are in a position in relation to each other representative of their condition in use in said valve; and fixing said rings in said workpiece in relation to each other.

4,376,886

METHOD FOR ELECTRON BEAM WELDING

Albert M. Sciaky, Palos Park; William J. Farrell, Flossmoor, and Julius L. Solomon, Chicago, all of Ill., assignors to Sciaky Bros., Inc., Chicago, Ill.

Filed Jan. 2, 1981, Ser. No. 222,722
Int. Cl.³ B23K 15/00
U.S. Cl. 219—121 ED 3 Claims



1. A method of seam welding two workpieces by the electron beam welding process so as to form a seam along the full length of their adjacent edges, including the steps of:

causing the beam to dwell for a predetermined period at a first position on the adjacent edges of said workpieces while said workpieces are at rest;

deflecting the beam transversely from said adjacent edges for a predetermined distance to one side of said seam and

maintaining the beam in this position for a predetermined time;

returning the beam to the seam and maintaining it in position for a second predetermined time;

deflecting the beam to the opposite side of the seam from its first motion and maintaining it in this position for a predetermined time;

returning the beam to the center of the seam and maintaining it at this point for a predetermined time; and

repeating the above program of beam displacement and dwell time continuously as the work is moved under the beam.

4,376,887

DEVICE FOR THE THERMAL ERASURE OF MECHANICALLY READABLE OPTICAL MARKINGS

David L. Greenaway, Oberwil; Joseph A. Clarinval, Rotkreuz, and Alex Nyfeler, Baar, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

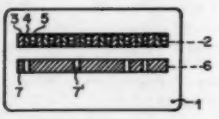
PCT No. PCT/CH79/00140, § 371 Date Sep. 22, 1980, § 102(e) Date Sep. 22, 1980, PCT Pub. No. WO80/01616, PCT Pub. Date Aug. 7, 1980

PCT Filed Oct. 29, 1979, Ser. No. 207,969

Claims priority, application Switzerland, Feb. 1, 1979, 977/79

Int. Cl.³ G06K *19/06, 7/10*

U.S. Cl. 235—487 11 Claims



1. An apparatus adapted for thermally erasing or changing machine readable optical markings previously entered on a carrier of thermoplastic material having two major sides, the optical markings causing a predetermined modification of any light rays impinging on said optical markings by either diffraction or refraction,

comprising in combination:

erasing means adapted to be located on one major side of said carrier, for erasing or changing said markings,

reading means, operative during operation of said erasure means, and including at least two light sensors adapted to be located on the other major side of said carrier, so as to check the erasure or change of said markings effected by said erasing means, the light sensors providing output signals of respective opposite polarities following erasure or change of any one of said markings,

moving means operable for generating a relative movement between said carrier and said erasing and reading means, respectively,

a comparator postcoupled to said light sensors, and including detection means for indicating whether the output of said comparator means exceeds or is below respective predetermined limits, and

control means for controlling the operation of said erasing means and of said moving means, and arranged to inhibit the operation of said erasure means when the output of said comparator means exceeds or falls below said limits, respectively, whereby said limits establish a uniform criterion for effecting erasure of said markings.

4,376,888

PHOTOELECTRIC CONVERSION TYPE INFORMATION PROCESSING DEVICE

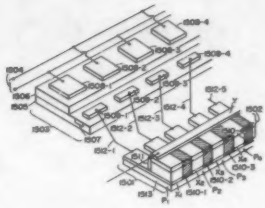
Tadaji Fukuda, Kawasaki, and Takashi Nakagiri, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 31,587, Apr. 19, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,448

Claims priority, application Japan, Apr. 20, 1978, 53-47097; Apr. 20, 1978, 53-47098

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—211 J 30 Claims



1. A photoelectric conversion type information processing device, comprising:

a single dimensional, elongated photoelectric conversion section having n numbers of photoelectric conversion elements arranged in an array on a substrate, each of said photoelectric conversion elements having a thin-film vapor-deposited photoelectric conversion layer, one electrode provided independently for each of said photoelectric conversion elements and another electrode provided common to said photoelectric conversion elements; and

a time-sequential signal conversion section which, in response to a light signal input, introduces thereinto in parallel k numbers of signal outputs from said photoelectric conversion section, and which renders at least a part of said k numbers of signal outputs time-sequential, where $k \leqq n$.

4,376,889

LOW LIGHT LEVEL VISION APPARATUS

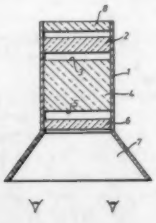
David W. Swift, Prestatyn, Wales, assignor to Pilkington P.E. Limited, Helens, England

Continuation of Ser. No. 910,699, May 25, 1978, abandoned. This application Mar. 27, 1980, Ser. No. 134,470

Claims priority, application United Kingdom, Jun. 4, 1977, 23822/77

Int. Cl.³ H01J *31/50, 40/14*

U.S. Cl. 250—213 VT 28 Claims



1. Optical apparatus for low light level or night vision use to enable in-focus viewing of two different objects or scenes at different distances from the apparatus, comprising:

image intensifier means for producing an intensified image of said objects or scenes for viewing through the apparatus;

viewing means for enabling an observer to view a magnified

version of the image produced by said image intensifier means; and

filter and focussing means disposed in the light path between said objects or scenes and said image intensifier means for transmitting filtered and focussed light from said objects or scenes to said image intensifier means, said filter and focussing means comprising:

an objective lens disposed in said light path for focussing light from one of said objects or scenes on said image intensifier means;

a wavelength selective filter disposed in said light path for transmitting therethrough along a first optical path incident light of a selected wavelength band or bands, said filter having a hole therein through which incident light of other wavelengths can pass along a second optical path; and

focus correction means arranged to act only on light passing along one of said two optical paths and cooperative with said objective lens to focus on said image intensifier means the light from the other of said objects or scenes which passes along said one optical path, while light of said other wavelengths from said one object or scene which passes along the other of said optical paths is focussed on said image intensifier means by said objective lens without the aid of said focus correction means,

whereby in-focus images of the two objects or scenes at different distances from the apparatus are presented for viewing by the observer.

4,376,890

FIBER-OPTIC TEMPERATURE-MEASURING APPARATUS

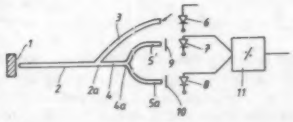
Olof Engström, and Christer Ovrén, both of Västerås, Sweden, assignors to Asea Aktiebolag, Västeras, Sweden

Filed Oct. 6, 1980, Ser. No. 194,397

Claims priority, application Sweden, Oct. 10, 1979, 7908382

Int. Cl.³ G02B 5/14

U.S. Cl. 250—227 **28 Claims**



1. A fiber-optic temperature-measuring apparatus comprising:

a body of a temperature-dependent photo-luminescent solid semi-conductive material wherein said body is subjected to a temperature to be measured;

a source of exciting radiation directed to said body so as to cause said body to luminesce and produce luminescent radiation;

fiber-optic means for directing said exciting radiation to said body;

measuring means operatively associated with said body;

fiber-optic means for directing said luminescent radiation from said body to said measuring means; and

two photodetectors having mutually dissimilar spectral response curves operatively associated with said measuring means and provided for receiving said luminescent radiation via said fiber optic means for directing said luminescent radiation from said body to said measuring means.

4,376,891

METHOD AND APPARATUS FOR PRODUCING ELECTRON BEAM DIFFRACTION PATTERNS

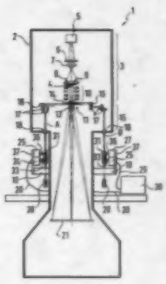
Günter Rauscher, Finsterwalderstrasse 22, D-8000 Munich 50, and Helmut Formanek, Rilmerhofweg 51, D-8046 Garching, both of Fed. Rep. of Germany

Continuation of Ser. No. 145,003, Apr. 29, 1980, abandoned. This application Dec. 9, 1981, Ser. No. 329,076

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008404

Int. Cl.³ G01N 23/00

U.S. Cl. 250—307 **15 Claims**



1. A method of producing electron beam diffraction patterns, in which an object to be examined is irradiated by means of an electron beam accelerated by a predetermined voltage, the electrons of an electron beam diffracted by the object producing an image on an integrating image apparatus or an integrating image material, the object being examined being an organic or biological substance having a periodic structure, wherein said electron beam has an electron density of less than one electron per square Angstrom, wherein at least one region of the object corresponding in size to the cross section of the electron beam is irradiated intermittently using an electron beam accelerated by the pre-determined voltage, and wherein irradiation is carried out over such a period of time that the electron density of the electron beam, integrated during this time, is at least equal to the electron density necessary to produce an image, whereby the amount of electron density received at each point of the object is limited.

4,376,892

DETECTION AND IMAGING OF THE SPATIAL DISTRIBUTION OF VISIBLE OR ULTRAVIOLET PHOTONS

Georges Charpak, Paris; N'Guyen N. Hoan, Verrieres-le-Buisson, both of France; Armando Policarpo, Coimbra, Portugal, and Fabio Sauli, Geneva, Switzerland, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Oct. 16, 1980, Ser. No. 197,611

Int. Cl.³ G01J 1/42; G01T 1/18

U.S. Cl. 250—372 **7 Claims**

1. A device for detection and two-dimensional localization of a field of visible and ultraviolet photons, comprising:

a first noble gas-filled enclosure defined by a lateral wall, a radiation input window and an output window,

a photo-cathode layer on the inner surface of said window selected to deliver photo-electrons in response to photons,

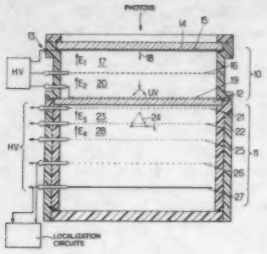
electrode means in said first enclosure to create an electrical field transverse to said input window of a value which imparts additional energy to said photo-electrons and causes far UV production in response to said photo-electrons, without substantial electron multiplication,

and a second enclosure separated from said first enclosure by said output window of a material transparent to said UV photons,

a gas mixture including noble gas and an easily ionizable compound in said second enclosure,

a plurality of electrodes in said second enclosure,

and circuit means associated with said electrodes for applying voltages to said electrodes selected for causing avalanche processes to occur in said gas mixture responsive to said far UV photons, whereby said enclosure and electrodes constitute a proportional counter for determining the location of said far UV photons.



4,376,893

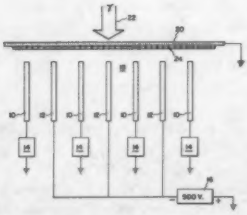
ION CHAMBER ARRAY WITH REDUCED DEAD SPACE

Nathan R. Whetten, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 676,282, Apr. 12, 1976, abandoned. This application May 18, 1978, Ser. No. 907,117

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—374 **9 Claims**



1. An X-ray permeable structure for admitting X-rays into an ionization chamber X-ray detector array, comprising:

a first sheet of electrically conductive material;

a thin continuous layer of dielectric material having a major surface disposed on an inner major surface of said first sheet;

a second continuous sheet of conductive material having a major surface disposed on the major surface of said dielectric sheet opposite said first sheet of conductive material; and

means for maintaining said second sheet of conductive material at or near the potential of one or more cathode structures,

whereby electrons produced by X-ray interactions in a region between said second sheet of conductive material and said cathode structure are caused to flow to one or more adjacent anode structures for collection and measurement.

4,376,894

DEVICE FOR DRIVING A ROTARY-ANODE X-RAY TUBE

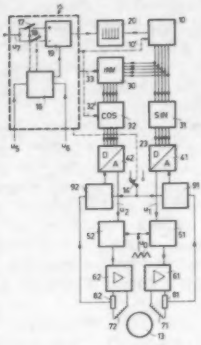
Gerd Vogler, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,700

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103630

Int. Cl.³ H02P *7/42*; H05G *1/66, 1/70*

U.S. Cl. 378—110 **5 Claims**



1. In a device for driving a rotary-anode X-ray tube comprising an asynchronous motor having stator windings each supplied with an alternating current of predetermined frequency via a respective switching amplifier, the improvement comprising:

(a) a pulse width modulator for controlling a respective switching amplifier, the pulse-width modulator producing an output signal having a high pulse frequency in comparison with the motor speed,

(b) an alternating voltage generator for each stator winding, the various alternating voltage generators generating output phase-shifted sinusoidal alternating voltages,

(c) a current measuring member for each stator winding for measuring the current through the stator windings, an output signal of said current measuring member being compared with a reference value signal in a comparison circuit,

(d) means connecting the output of an alternating voltage generator to an input of the pulse-width modulator, at least the switching amplifier, the current measuring member and the comparison circuit forming a control loop for reducing the difference signal between the reference value signal and the output signal of the current measuring member.

4,376,895

ELECTROMECHANICAL SWITCHING DEVICE

Jack B. Meister, 68 Chimney Ridge Rd., Convent Station, N.J. 07961

Filed Oct. 24, 1979, Ser. No. 88,076

Int. Cl.³ H01H *67/02*

U.S. Cl. 307—9 **2 Claims**

2. In a motor vehicle, an electrical relay mechanism subject to vibration caused by movements of said vehicle, comprising:

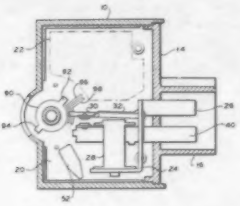
a pair of electrical contacts having open and closed positions;

means comprising a single spring biased armature for controlling the opening and the closing of said electrical contacts and having an open position in which said contacts are open and a closed position in which said contacts are closed, said open and closed positions being spaced apart by a distance such that vibrations of the

vehicle will not cause the armature to move to its closed position and close said electrical contacts;

means for mounting said armature in operative association with said contacts for free reciprocation between said open position and said closed position, without stop means or other mechanical restraint except for the bias of said spring;

an electromagnetic coil having a pole piece spaced from said armature by a distance such that the magnetic field emanating from said pole piece is insufficient to draw said



armature from its open position against the bias of said spring; and

manually operated means for mechanically moving said armature from its open position to a position intermediate said open and said closed positions and at the same time energizing said coil with a current of sufficient strength to create a magnetic field of sufficient strength to draw said armature from its intermediate position to its closed position and to maintain said armature in its closed position until said current is interrupted.

4,376,896

SWITCHING ASSEMBLY

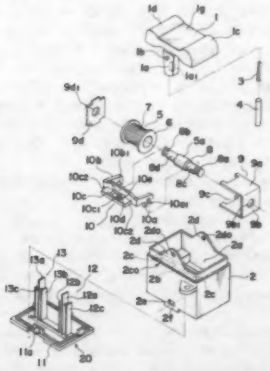
Nobuhiro Takeda; Shigeo Mizuno; Yukio Takaishi, and Masaichi Hattori, all of Nagoya, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Apr. 10, 1980, Ser. No. 139,273

Claims priority, application Japan, Jul. 30, 1979, 54-104089[U]

Int. Cl.³ H01H *21/60*; H02H *7/085*

U.S. Cl. 307—115 **5 Claims**



1. A switching assembly to be incorporated in an electric regulator, which comprises:

a knob which is capable of being pivotally moved selectively clockwise and counterclockwise, with its operating leg portion being maintained in a downwardly urged condition;

a pivotal angle adjusting means, which defines respective paired first and second stages on either side of a basic stage, to thereby permit said operating leg portion of said knob to be selectively driven to one of said paired said first operating stage and said second operating stage via said first operating stage when said knob is pivotally moved selectively clockwise and counterclockwise;

two paired electric changing-over contacts each having a common contact electrically connected to a terminal of an electric motor, each of said two paired electric change-over contacts being correspondingly changed over in association with selective rightward and leftward drive of said operating leg portion with the help of a member interconnecting said operating leg portion with said respective electric changing-over contacts;

a self-retaining means which is capable of retaining said knob at one of said second stages subject to the condition that said knob is pivotally driven to said corresponding one of second stages;

an actuating means including a transistor for detecting an excess flow of electric current through said electric motor, said transistor operating said self-retaining means; and

an electric circuit, wherein said self-retaining means is electrically connected to each of said common contacts through a respective diode;

wherein said pivotal angle adjusting means is either integrally formed with a casing or permanently affixed to said casing; and

wherein said self-retaining means includes a bi-directionally operating type solenoid which is so arranged that, upon pivotal movement of said knob to said fist stage, the attraction of said solenoid can be set smaller than a restoring force of said knob, with said knob being capable of returning to a neutral position upon releasing said knob from an operating force, and upon pivotal movement of said knob to said second stage, the attraction of said solenoid can be set larger than said restoring force of said knob, with attracting forces thereof capable of self-retaining said knob at said second stage position.

4,376,897

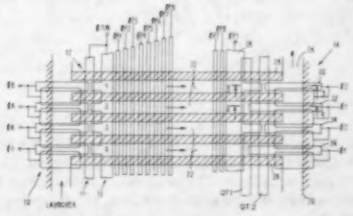
LOW VOLTAGE SERIAL TO PARALLEL TO SERIAL CHARGE COUPLED DEVICE

John J. Byrne, New Canaan, Conn.; Jean M. Ferre, Coudray Montceaux, France, and Yelandur R. Gopalakrishna, Wappingers Falls, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,851

Int. Cl.³ G11C *19/28*; H01L *29/78*

U.S. Cl. 377—63 **3 Claims**



1. A serial to parallel to serial charge coupled device shift register memory of the type having a plurality of channels in a semiconductor substrate with transfer diodes positioned thereover activated by a series of sequential transfer pulses for transfer of data in the form of charge packets along the parallel channel to form parallel shift registers and additional channel for a single serial shift register at the output ends of said plurality of parallel channels, comprising,

a plurality of gate electrodes of two different lengths overly-

ing the channel of said serial register with the longer electrodes also overlying the ends every other of the plurality of channels for said parallel shift registers and the shorter gate electrodes positioned between each two longer electrodes at the end of the intervening channels for the parallel registers,

a single gate electrode overlying all of the channels of said parallel shift register adjacent to said plurality of said gate electrodes and having extensions juxtaposed between said longer electrodes and facing said shorter electrodes, said single gate electrode being activated by one of said series of sequential pulses, and

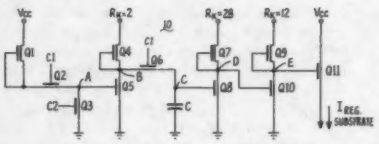
transfer electrode means overlying said longer of the plurality of gate electrodes and said extensions for transfer of data from said parallel registers to said serial registers in two groups.

4,376,898

BACK BIAS REGULATOR

Richard Z. Desmarais, Cupertino, Calif., assignor to Data General Corporation, Westboro, Mass.

Filed Feb. 29, 1980, Ser. No. 125,770
Int. Cl.³ H03K *3/01, 3/353*
U.S. Cl. 307—297 **3 Claims**



1. In an MOS integrated circuit with switching performance controlled by the presence of specified circuit parameters including internal circuit clock pulses, and having a generator to back bias the integrated circuit substrate, an improved back bias generator regulator circuit comprising:

regulator means for providing a regulating signal to produce a back bias substrate signal to offset any adverse influence of changing circuit parameters on the switching performance of said MOS integrated circuit;

sensing means responsive to internal circuit clock pulses within the MOS integrated circuit substrate for providing a sense signal;

means for storing the sense signal as a d.c. level; and

means for providing a signal to said regulator means to regulate the back bias voltage if the stored sense voltage fails to reach a specified level in one clock pulse period.

4,376,899

MOLECULAR CRYSTAL FOR NON-LINEAR OPTICS

Dahiel Chemla, 50, Avenue Jean Jaures, 92290 Chatenay-Malabry; Joseph Zyss, 28, rue Desaix, 75015 Paris, and Jean-Francois Nicoud, Residence F. Leroux, rue F. Leroux, Orsay, all of France

Continuation of Ser. No. 214,988, Dec. 10, 1980, abandoned.
This application Oct. 8, 1981, Ser. No. 309,790
Claims priority, application France, Dec. 21, 1979, 79 31455
Int. Cl.³ H03F *7/00*
U.S. Cl. 307—425 **1 Claim**

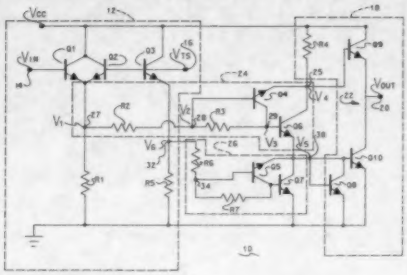
1. In a process using a molecular crystal in non-linear optics the step of using as the crystal molecules selected from the group consisting of 3-methyl-4-nitro-pyridine-1-oxide, 5-methyl-4-nitropyridine-1-oxide and 3,5-dimethyl-4-nitropyridine-1-oxide.

4,376,900

HIGH SPEED, NON-SATURATING, BIPOLAR TRANSISTOR LOGIC CIRCUIT

Lenard M. Metzger, 901 Elmgrove Rd., Rochester, N.Y. 14650

Filed Oct. 20, 1980, Ser. No. 198,580
Int. Cl.³ H03K *19/013, 19/082, 17/04*
U.S. Cl. 307—473 **1 Claim**



1. A tri-state digital logic circuit employing bipolar transistors operable in an unsaturated state comprising:

(a) a first input terminal for receiving first and second digital logic signals;

(b) voltage supply means;

(c) a first transistor connected to the voltage supply means and to the first input terminal, said first transistor being characterized as having respective conductive and non-conductive states in response to the presence of the first and second digital logic signals at the first input terminal;

(d) an output terminal;

(e) an output driver stage including (1) a second transistor coupled between the voltage supply means and the output terminal, and (2) a third transistor coupled between the output terminal and ground;

(f) a first control circuit coupled between the first transistor and the output drive stage comprising (1) a fourth transistor having a base, an emitter, and a collector, the collector being coupled to the second transistor and the emitter being coupled to the third transistor; (2) a fifth transistor having a base, an emitter, and a collector, the emitter being connected to the collector of the fourth transistor and the collector being connected to the base of the fourth transistor, and (3) a first resistive divider network coupled between the first transistor and the base of the fourth transistor and having a portion thereof coupled between the base and the collector of the fifth transistor for deriving from the voltage supply means biasing voltages that produce a greater forward bias on the fifth transistor than on the fourth transistor;

(g) a second input terminal for receiving first and second tri-state control signals;

(h) a sixth transistor connected to the voltage supply means and to the second input terminal, said sixth transistor being characterized as having respective conductive and non-conductive states in response to the presence of the first and second tri-state control signals at the second input terminal;

(i) a seventh transistor connected to the voltage supply means, the second input terminal and the first control circuit, said seventh transistor being characterized as having respective conductive and non-conductive states in response to the presence of the first and second tri-state control signals at the second input terminal; and

(j) a second control circuit coupled between the sixth transistor and the output drive stage comprising (1) an eighth transistor having a collector coupled to the third transistor and a base, (2) a ninth transistor having a base, an emitter, and a collector, the emitter being coupled to the collector

of the eighth transistor and the collector being coupled to the base of the eighth transistor, and (3) a second resistive divider network coupled between the sixth transistor and the base of the eighth transistor and having a portion thereof coupled between the base and collector of the ninth transistor for deriving from the voltage supply means biasing voltages that produce a greater forward bias on the ninth transistor than on the eighth transistor,

the second control circuit having a conductive state when the sixth and seventh transistors are conductive in response to the presence of the first tri-state control signal at the second input terminal for causing the fourth and eighth transistors to turn on, the fifth transistor being configured so that during the fourth transistor's conduction it turns on and (1) diverts base current from the fourth transistor and (2) clamps the collector voltage of the fourth transistor at a predetermined level, thereby preventing the fourth transistor from being driven into saturation, and the ninth transistor being configured so that during the eighth transistor's conduction it turns on and (1) diverts base current from the eighth transistor and (2) clamps the collector voltage of the eighth transistor at a predetermined level thereby preventing the eighth transistor from being driven into saturation, the collector voltages of the fourth and eighth transistors being clamped at sufficiently low levels so as to turn off the second and third transistors, whereby the output terminal is set to a high impedance output state,

the second control circuit also having a non-conductive state when the sixth and seventh transistors are non-conductive in response to the presence of the second tri-state control signal at the second input terminal whereby the digital logic circuit operates as a line driver in response to the presence of the first and second digital logic signals at the first input terminal, the first control circuit having a (1) non-conductive state when the first transistor is non-conductive in response to the presence of the first digital logic signal at the first input terminal for causing the third transistor to turn off and the second transistor to turn on and produce a first digital logic signal at the output terminal and (2) a conductive state when the first transistor is conductive in response to the presence of the second digital logic signal at the first input terminal for causing the second transistor to turn off and the third transistor to turn on and produce a second digital logic signal at the output terminal, the fourth, fifth and second transistors being configured so that they turn on in response to a drop in the collector voltage of the third transistor to a predetermined level and provide the third transistor with sufficient collector current to prevent the third transistor from being driven into saturation.

4,376,901

MAGNETOCUMULATIVE GENERATOR

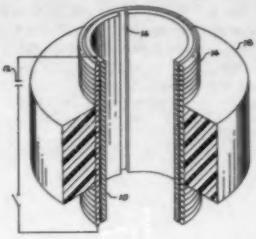
Joseph S. Pettibone, and Paul C. Wheeler, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1981, Ser. No. 271,060
Int. Cl.³ H02K *45/00*
U.S. Cl. 310—10 **10 Claims**

1. Apparatus for increasing the energy of a magnetic field, which comprises:

a housing having an electrically conducting surface defining a housing chamber within which said magnetic field is disposed; and

explosive means for changing the contour of said housing chamber so that the energy contained in said magnetic field is increased substantially by stretching the magnetic



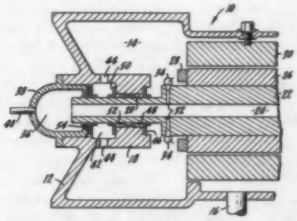
field lines of said magnetic field to additional length within the housing chamber.

4,376,902

HERMETIC DYNAMOELECTRIC DEVICE WITH TWO-PHASE REFRIGERANT COOLING AND SEALING

Alex J. Sousa, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 3, 1982, Ser. No. 354,335
Int. Cl.³ H02K *9/20*
U.S. Cl. 310—54 **6 Claims**



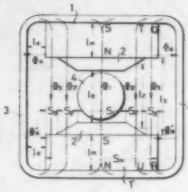
1. A hermetic motor comprising a housing defining a motor plenum adapted for fluid communication with an associated evaporator, said housing also defining a refrigerant plenum in fluid communication with said motor plenum, a bearing supported by said housing, a shaft journaled in said bearing, a first seal interposed between said bearing and motor plenum and defining with said bearing a first oil chamber, a second seal interposed between said bearing and refrigerant plenum and defining with said bearing a second oil chamber, said chambers being adapted for fluid communication with an associated oil reservoir, said shaft having a stepped bore including a first relatively small bore portion in fluid communication with said refrigerant plenum, a second relatively large bore portion in fluid communication with said first bore portion, and a shoulder at the junction of said bore portions, a rotor secured to said shaft, a stator secured to said housing, a plurality of jets adjacent said rotor in fluid communication with said second bore portion, and a line adapted for fluid communication with an associated condenser, said line being in fluid communication with said second bore portion for delivery of liquid refrigerant thereto.

4,376,903

DIRECT CURRENT DYNAMO ELECTRIC MACHINE

Matsuo Mishima, Tokyo, Japan, assignor to Micro Technology Laboratory Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 750,890, Dec. 15, 1976, abandoned. This application May 9, 1980, Ser. No. 148,288
Claims priority, application Japan, Dec. 23, 1975, 50-153703; Dec. 29, 1975, 50-159022
Int. Cl.³ H02K 21/28
U.S. Cl. 310—154 7 Claims



1. A direct current dynamo electric machine comprising:

(a) a non-magnetic cylindrical rotor comprising (i) a rotor shaft, (ii) a small diameter sleeve-like insulating cylinder secured to the rotor shaft, (iii) a winding structure with a high-density winding disposed around the outer periphery of the insulating cylinder to occupy a substantial portion of the volume of the rotor between the outer periphery of the insulating cylinder and the outer diameter of the rotor, and (iv) means for disposing of and shaping a large number of coil ends of the winding; and

(b) a stator for rotatably supporting the rotor and comprising (i) a yoke, (ii) a pair of main magnets disposed in opposing relation to each other in the yoke, the main magnets being rectangular in cross-section and larger in width than the outer diameter of the rotor in a direction perpendicular to a magnetic field established by the main magnets, (iii) thin trapezoidal pole shoes mounted on the opposing surfaces of the main magnets along substantial portions of the entire areas of the surfaces thereof and wherein each pole shoe has a rotor-opposing surface corresponding to the diameter of the rotor and the pair of pole shoes define therebetween a large working air gap to form a double-pole magnetic field corresponding to the outside portion of the rotor, and (iv) a pair of blocking permanent magnets disposed in opposing relation to each other on opposite sides of the rotor between the main magnets with air gaps formed at both ends of each blocking permanent magnet, for equalizing leakage magnetic fields occurring on both sides of the rotor between those surface portions of the main magnets and the pole shoes not facing the rotor with a reverse magnetic field of the blocking permanent magnets, thereby to converge magnetic fluxes on the rotor.

4,376,904

INSULATED ELECTROMAGNETIC COIL

Raymond J. Horrigan, deceased, late of Erie, Pa. (by Doris C. Horrigan, executrix), assignor to General Electric Company, Erie, Pa.

Filed Jul. 16, 1981, Ser. No. 283,851
Int. Cl.³ H01H 85/22; H02K 3/041
U.S. Cl. 310—208 5 Claims

1. A helical electromagnetic coil comprising:

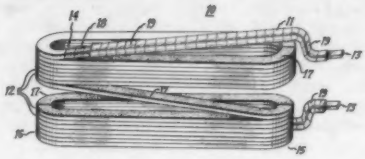
a. a plurality of turns including a pair of end turns respectively disposed at opposite ends of the coil;

b. said end turns having distal sections that are integrally joined, respectively, to a pair of terminal leads extending beyond the boundary of the coil to provide means for connecting the coil in an electrical circuit;

c. first and second overlapping layers of fluorinated ethylene propylene resin-coated polyimide tape wrapped around the distal section of each end turn of said coil and around each of said terminal leads, said layers being bonded to one another and to said sections and said leads;

d. a plurality of thin laminae of fluorinated ethylene propylene resin-impregnated glass cloth respectively disposed between and bonded to adjacent turns of said coil;

e. an inner layer of said tape wrapped around the turns of



said coil including a first portion but not all of the distal section of each end turn, said inner layer being bonded to the surface of the turns that it covers; and

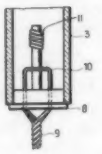
f. at least one additional layer of said tape wrapped around said coil so as to cover said inner layer and a second portion of the distal section of each end turn, said additional layer being bonded to said inner layer.

4,376,905

ELECTRIC LAMP PROVIDED WITH A CERAMIC DISCHARGE TUBE

Bela Kerekes, Budapest, Hungary, assignor to Egyesült Izzolampa es Villamossagi Rt., Budapest, Hungary

Filed Feb. 4, 1981, Ser. No. 231,237
Claims priority, application Hungary, Feb. 11, 1980, 304/80
Int. Cl.³ H01J 17/04, 17/16, 61/52
U.S. Cl. 313—217 8 Claims



1. An electric lamp with a ceramic discharge tube having a discharge tube made of a ceramic material or a crystalline structure, an electrode within the tube, a current inlead connecting the electrode to an outer current lead and ceramic closing members closing the ends of the tube, at least one of which is made of a ceramic material, wherein the electrical connection between the outer current lead and the electrode is established by means of a current inlead consisting of two or more elementary filaments passing through the ceramic closing member and separately soldered in a vacuum tight manner into the ceramic closing member, at least one elementary filament connected electrically to the current feeder and passing through the ceramic closing member is formed as an auxiliary electrode and/or as a current inlead of the auxiliary electrode.

4,376,906

ELECTRODE RIBBON SEAL ASSEMBLY

Imre Szilagyi, Sunnyvale, and Steven Alexander, San Jose, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

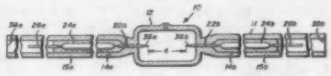
Continuation of Ser. No. 134,536, Mar. 27, 1980, abandoned. This application Apr. 21, 1982, Ser. No. 370,592
Int. Cl.³ H01J 5/50
U.S. Cl. 313—332 9 Claims

1. An improved high-intensity lamp, comprising:

a glass arc tube envelope forming a cavity adapted to receive a pair of electrodes therein;

a pair of glass side arms rigidly fused to said arc tube envelope, each of the side arms being adapted to receive one prebeaded electrode assembly therewithin; and

a pair of prebeaded electrode assemblies, each of said prebeaded electrode assemblies being pre-constructed from an electrode ribbon assembly consisting of a ribbon foil conductor attached to an electrode on one end and to an electrical termination on the other end, said electrode



ribbon assemblies being encased and sealed within a glass sleeve vacuum shrunk about said ribbon foil conductor, a part of said electrode, and part of said electrical termination prior to the insertion of said prebeaded electrode assemblies into said side arms,

wherein said prebeaded electrode assemblies are intimately fused to said sidearms with said electrodes protruding into said arc tube envelope to strengthen the resulting structure.

4,376,907

TELEVISION CAMERA TUBE WITH DIODE ELECTRON GUN

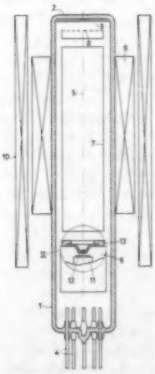
Erich E. Himmelbauer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,510

Claims priority, application Netherlands, Jul. 12, 1979, 7905440; Apr. 8, 1980, 8002037

Int. Cl.³ H01J *29/48, 29/62, 31/38*

U.S. Cl. 313—389 **9 Claims**



1. A television camera tube comprising a photosensitive target for producing electrical signals corresponding to an optical image formed thereon, a diode electron gun for producing an electron beam, and means for focussing the electron beam on the target, said diode electron gun including, arranged successively along an axis of the tube, a cathode having an emissive surface extending substantially perpendicularly to the axis and an anode having a central aperture around the axis, a part of the anode surrounding the central aperture being situated closer to the cathode than the remainder of the anode, said part of the anode having an area which is smaller than 75% of the emissive surface of the cathode.

4,376,908

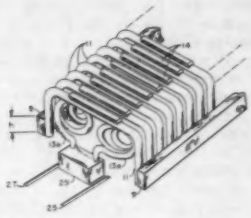
IMPEDANCE TAPERED DEMATRON

Edwin G. Chaffee, Redwood City, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1980, Ser. No. 220,485

Int. Cl.³ H01J *25/34*

U.S. Cl. 315—39.3 **7 Claims**



1. A crossed field amplifier adapted to amplify input signals in the microwave region, comprising, rf signal input and output means, means establishing an electron beam, a linear slow wave structure of the ladder type for propagating said rf signal and interacting with said beam, said slow wave structure including an array of U-shaped rungs in closely spaced parallel relationship extending from the input end to the output end, a pair of oppositely wound helices running along respective sides of said rungs inside said array, said helices having a pitch equal to the spacing of said rungs, and a pair of rf field trimmers of rectangular cross section running continuously along the outside of each side of said array of rungs and connecting the open ends of all adjacent rungs, the trimmer height being larger along a first longitudinal portion adjacent the input end and smaller along a second longitudinal portion adjacent the output end.

4,376,909

AUTOMATIC LIGHT CONTROL FOR AUTOMOTIVE VEHICLES

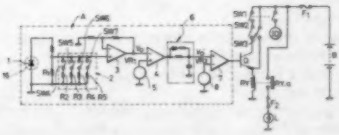
Katsutoshi Tagami, Asaka, and Yoshikazu Tuchiya, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,528

Claims priority, application Japan, Apr. 13, 1979, 54-45111; Apr. 13, 1979, 54-45112

Int. Cl.³ B60Q *1/02*

U.S. Cl. 315—82 **11 Claims**



1. An automatic light control system for an automotive vehicle having lights, comprising:

(1) a direct current power source;

(2) an ignition switch connected to said power source;

(3) a first switch connected to said power source;

(4) a second switch connected to said power source by way of said first switch, said second switch being electronically actuable;

(5) relay means connected to said lights and adapted to be energized in response to concurrent closing of said first switch and energization of said second switch;

(6) a brightness sensor responsive to ambient brightness in

the vicinity of the vehicle to produce an output signal as a function of the ambient brightness;

(7) amplifier means for amplifying said output signal;

(8) comparator means for comparing the output signal of said brightness sensor and a predetermined reference signal to switch said second switch in response to a difference between said two signals; said comparator means including a first comparator connected to said brightness sensor for comparing said output signal from said brightness sensor with a first predetermined reference voltage; an integrating circuit for integrating an output voltage from said first comparator; and a second comparator adapted to compare an integral output voltage from said integrating circuit with a second reference voltage; whereby said second switch is actuated by an output from said second comparator for switching action with an effective delay duration characteristic with respect to the output of said brightness sensor; and

(9) a third switch connected in parallel with said first and second switches for energizing, at a closed position thereof, said relay means, irrespective of the switched condition of said first and second switches, said third switch operating independently of the ignition switch, whereby said lights are energized upon energization of said relay means, and, with said first switch and the ignition switch in closed condition, said lights are automatically responsive to the ambient brightness in the vicinity of the vehicle.

4,376,910

POWER SUPPLY AND CONTROL DEVICE FOR THE PROPER OPERATION OF A RAILWAY TRAFFIC LIGHT

Jacques F. Peslier, Manou, France, assignor to Jeumont-Schneider, Puteaux, France

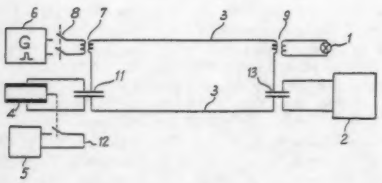
PCT No. PCT/FR80/00110, § 371 Date Mar. 16, 1981, § 102(e) Date Mar. 16, 1981, PCT Pub. No. WO81/00238, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 4, 1980, Ser. No. 247,538

Claims priority, application France, Jul. 16, 1979, 79 18323

Int. Cl.³ H05B *37/03*

U.S. Cl. 315—134 **9 Claims**



1. A system for energizing and monitoring the operation of a railway traffic light, comprising:

an alternating current power source;

an electric lamp;

a first transformer having primary and secondary coils, said primary coil being connected to said alternating current source;

a second transformer having primary and secondary coils, said second transformer secondary coil being connected to said electric lamp; p1 a first safety capacitor having two plates and two terminals connected to each of said plates;

a second safety capacitor having two plates and two terminals connected to each of said plates;

a long power supply line connecting said secondary of said first transformer, said primary of said second transformer, one of said terminals on each plate of said first safety capacitor and one of said terminals on each plate of said second safety capacitor in series circuit;

a lamp operation detector having an output connected to the other terminal on each plate of said second capacitor, said detector including means for sensing the operational state of said lamp and means responsive to said sensing means for producing a direct current on said output indicative of an operational state sensed by said sensing means; and

receiver means connected to the other terminal on each plate of said first capacitor for producing an output signal in response only to said direct current.

4,376,911

CIRCUIT SYSTEM FOR LIGHTING A DISCHARGE LAMP OR LAMPS

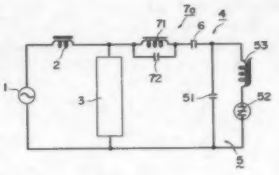
Isao Kaneda, Otsu, Japan, assignor to New Nippon Electric Co., Ltd., Osaka, Japan

Filed Dec. 18, 1980, Ser. No. 217,901

Claims priority, application Japan, Dec. 28, 1979, 54-173429; Apr. 18, 1980, 55-52192; Aug. 28, 1980, 55-119391

Int. Cl.³ H05B *41/14*

U.S. Cl. 315—244 **20 Claims**



1. A discharge lamp lighting circuit system, comprising: low frequency alternating current power supply means for supplying a low frequency alternating current, discharge lamp means coupled to said low frequency alternating current power supply means, linear inductor means coupled between said low frequency alternating current power supply and said discharge lamp means, intermittent high frequency, high voltage generating means operatively connected for being energized by said lower frequency alternating current power supply means, for generating intermittently a high frequency energy in each half cycle of said low frequency alternating current, said high frequency energy being supplied to said discharge lamp means for reigniting said discharge lamp means in each half cycle of said low frequency alternating current power supply means, and supplied energy controlling means (7) operatively associated with said discharge lamp means and with said intermittent high frequency, high voltage generating means for controlling the energy supplied to said discharge lamp means, said supplied energy controlling means (7) comprising impedance circuit means having an impedance characteristic with a low impedance for high frequency and a high impedance for low frequency for supplying simultaneously to said lamp means in an optimally coordinated manner a low frequency current from said low frequency alternating current power supply and an intermittent high frequency current from said high voltage generating means during each half cycle of said low frequency alternating current for reigniting said discharge lamp means in each half cycle of said low frequency alternating current.

4,376,912

ELECTRODELESS LAMP OPERATING CIRCUIT AND METHOD

George Jernakoff, Loudonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,922

Int. Cl.³ H05B *41/16, 41/24*

U.S. Cl. 315—248 **17 Claims**

1. In an operating circuit for an electrodeless lamp, means for providing a reverse-bias current to the winding of a magnetic core electric field inducing means in said lamp to reduce

magnetic saturation of the core thereby to enhance electrical operating efficiency of said lamp comprising:

(a) controlled switching means comprising a switch, an input lead, an output lead, and a control means effective for repetitively operating said switch at radio frequencies to provide periodic intervals of transmission between said input and output leads;

(b) energizing means for applying direct current potential across the winding of said electric field inducting means when said switch is closed, said energizing means comprising a DC reference voltage bus and a ground terminal, said bus being connected to one terminal of said winding, said ground terminal being coupled to the output lead of said controlled switching means and said input lead of said controlled switching means being connected to the other terminal of said winding;

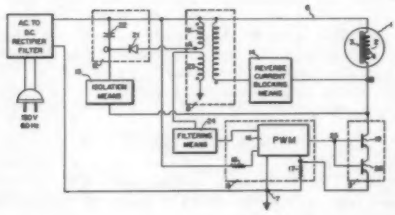
(c) a voltage transformer having a primary and a secondary each with first and second sides, and providing a voltage across said secondary which is proportional to and of opposite polarity to that across said primary;

(d) means connecting the first sides of both said primary and said secondary to said DC reference voltage bus terminal;

(e) filtering means comprising:

(i) a unidirectional conducting means having first and second electrodes, said first electrode connected to said second side of said voltage transformer secondary, and

(ii) charge storage means connected between the first side



of said voltage transformer secondary and the second electrode of said unidirectional conducting means;

(f) isolation means connected between said second electrode and said other terminal of said winding, whereby a substantially constant DC current flows through the isolation means, charge is stored when said switch is closed, and the stored charge flows through said winding in a reverse-bias direction when said switch is open; and

(g) reverse current blocking means connected between said second side of said primary and said other terminal of said winding, whereby

(i) an energizing current is supplied to said winding when said switch is closed,

(ii) said unidirectional conducting means prevents current flow through said secondary and said filtering means during opening of said switch,

(iii) said isolation means prevents transients at said winding from reaching said filtering means during opening of said switch without short circuiting said DC reference voltage bus to said ground terminal upon closing of said switch, and

(iv) said reverse current blocking means prevents currents developed by said filtering means from being conducted to said primary and thus allows substantially constant DC current to flow through said winding when said switch is open in a direction opposite to said energizing current thereby to minimize energy losses due to saturation of said core.

4,376,913

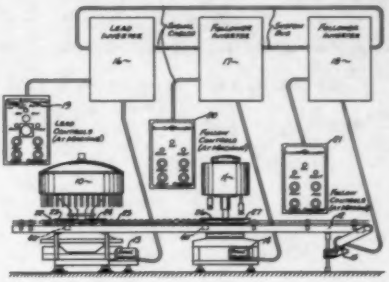
METHOD AND APPARATUS FOR SYNCHRONOUSLY DRIVING AC SYNCHRONOUS MOTORS

Bernard L. Higby, McKees Rocks, Pa., assignor to Horix Manufacturing Co., Pittsburgh, Pa.

Filed Jan. 16, 1981, Ser. No. 225,844

Int. Cl.³ H02P 5/46

U.S. Cl. 318—85 **9 Claims**



1. In a manufacturing or packaging assembly line system having a plurality of machines driven by respective AC synchronous motors and adapted to sequentially conduct successive steps of manufacture or packaging on articles moving in the assembly line, a drive control for synchronously driving said AC synchronous motors, said drive control including a plurality of AC inverters having polyphase variable frequency output signals consisting of polyphase sets of series of controlled frequency low voltage DC pulses which are amplified to respectively drive said motors at synchronized speeds, the improvement comprising circuit means in one of said inverters for generating one of said low voltage polyphase DC pulse sets and for transmitting said one low voltage polyphase DC pulse set to the remaining inverters for respective amplification by all inverters to thereby provide said respective polyphase output signals with positive phase synchronization.

4,376,914

MOTOR CONTROL DEVICE

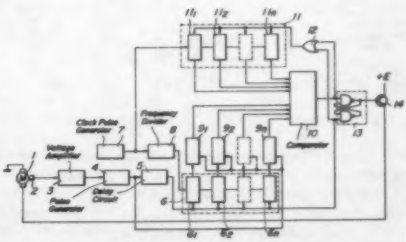
Kenji Kimura, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,239

Claims priority, application Japan, Mar. 11, 1980, 55-30592; Mar. 13, 1980, 55-32061

Int. Cl.³ G05B 19/28

U.S. Cl. 318—603 **3 Claims**



1. A motor control device comprising an electric motor, a first counter for counting clock signals having a certain frequency, means for resetting the first counter by an output corresponding to a rotational frequency of the motor and storing a counted content of the first counter immediately before the reset, a second counter for counting clock signals

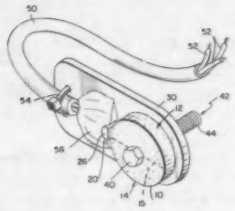
having a certain frequency higher than the above clock signal, and means for comparing the content of the first counter with that of the second counter, resetting the second counter by a coincidence of both the contents, generating output signals from the reset of the second counter to the reset of the first counter, and controlling a rotational frequency of the motor by the output signals.

4,376,915

TACHOMETER

Paul E. Penn, Indianapolis, Ind., assignor to Dart Controls, Inc., Zionsville, Ind.

Filed Mar. 30, 1981, Ser. No. 248,941
Int. Cl.³ G01P 3/48, 3/54
U.S. Cl. 324—168 8 Claims



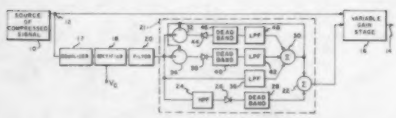
1. A tachometer, comprising a magnet, means for attaching the magnet to a rotating member on the rotating member's axis of rotation so that the magnetic field of the magnet is generally perpendicular to the axis of rotation of the rotating member, rotation of the rotating member resulting in corresponding rotation of the magnet, a plate, the plate including an opening, a bearing in the opening for rotatably coupling the plate to the rotating member, means for sensing movement of the magnet and for producing an output signal related to the rate of rotation of the rotating member, and means for mounting the movement sensing means on the plate in proximity to the magnet, whereby the movement sensing means is movable in an arc and is self-aligned with respect to the magnet.

4,376,916

SIGNAL COMPRESSION AND EXPANSION SYSTEM

John B. Glaberson, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed May 29, 1980, Ser. No. 154,729
Int. Cl.³ H03G 3/20; H04B 3/28
U.S. Cl. 330—136 25 Claims



1. In a circuit for the automatic compression or expansion of a signal between its input and its output, the circuit having a useful signal path connected between its input and its output and containing an electronically controllable variable gain device for varying the gain between the circuit input and output, and control signal generating means for generating responsively to the input signal to the useful signal path a control signal and for applying the control signal to the variable gain device for causing the gain between the input and the output of the useful signal path to have a value dependent on the value of the control signal, wherein said control signal generating means comprises:

rectifier means responsive to said input signal for producing a rectified signal having a level proportional to the amplitude of the input signal,

a relatively fast-acting short time constant smoothing filter connected to receive said rectified signal for filtering ripple therefrom and producing a direct voltage output the level of which substantially follows dynamic variations of the applied rectified signal, and

a network of signal paths having first and second primary branches having a common input terminal connected to receive the direct voltage from said smoothing filter and a common output terminal connected to said variable gain device for applying a control signal thereto,

said first primary branch including relatively fast-acting high pass filter means and a first unidirectional conducting device exhibiting a predetermined forward voltage drop for transmitting to the common output terminal only signals exhibiting a large, fast increase in amplitude sufficient to exceed the said forward voltage drop to cause said first unidirectional conducting device to conduct, and

said second primary branch including first and at least second signal paths,

said first signal path comprising relatively long time constant low pass filter means for transmitting to the common output terminal any direct voltage signals exhibiting small, slow changes in amplitude, and

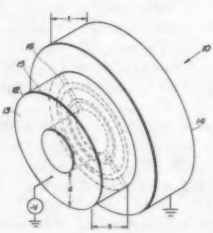
said at least second signal path comprising a second unidirectional conducting device exhibiting a predetermined forward voltage drop connected in series with second low pass filter means, said second unidirectional conducting device being poled to transmit to the common output terminal only signals exhibiting a relatively slow increase in amplitude sufficient to exceed the forward voltage drop of the second unidirectional conducting device to cause it to conduct.

4,376,917

SOLID-STATE CYCLOTRON MASER

Achintya K. Ganguly; Kenneth L. Davis, both of Alexandria, and Kwo R. Chu, Annandale, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1980, Ser. No. 163,003
Int. Cl.³ H01S 1/02
U.S. Cl. 331—94.1 10 Claims



1. A solid-state cyclotron maser, receiving a negative bias voltage and being exposed to an applied magnetic field, for generating low-power signals in the submillimeter frequency range, comprising:

an accelerating region, a drift region, and a metal grid therebetween,

said accelerating region and said drift region being formed from a semiconductor material having non-parabolic energy bands,

said drift region having front and back sides which are separated by a thickness t, t being of the order of one mean-free path for electrons in the semiconductor material,

said drift region having an outer surface which is coated with metal, said metal being at ground potential,

said front side of said drift region having a first opening in said metal, said first opening being shaped and located such that electrons couple most strongly with radio frequency fields of the drift region,

said back side of said drift region having a second opening in said metal, said second opening being located for coupling most strongly with the radio frequency fields of the drift region,

said metal grid being coupled to the opening on the front side of said drift region, said metal grid forming an ohmic contact between said accelerating region and said drift region,

said accelerating region having front and back sides which are separated by a thickness s, s being large enough to allow electrons to be accelerated to a velocity that is required for producing energy, the energy being sufficient to sustain RF oscillations, said front side being coated with a metal for forming an ohmic contact, the back side of the accelerating region covering the opening on the front side of said drift region,

the negative bias voltage being applied to the front side of said accelerating region for accelerating electrons in the accelerating region, said electrons moving through said grid and drift region, said magnetic field being applied at an angle to the axis of said drift region for causing the electrons to propagate in helical trajectories around lines of the magnetic field and through said drift region, said electrons bunching in phase in said drift region and radiating coherently, said radiation being coupled out of said drift region at said second opening on the back side of said drift region.

4,376,918

OVERTONE CRYSTAL OSCILLATING CIRCUIT

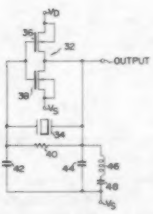
Eiji Masuda, and Shigemi Sakamoto, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 26, 1980, Ser. No. 190,951

Claims priority, application Japan, Oct. 4, 1979, 54-128393

Int. Cl.³ H03B *5/36*

U.S. Cl. 331—116 FE **16 Claims**



1. An overtone crystal oscillating circuit comprising:

a first complementary MOS inverter circuit having input and output terminals;

a crystal resonator connected between the input and output terminals of said inverter circuit;

resistive means connected between the input and output terminals of said inverter circuit;

first and second capacitances respectively connected to the input and output terminals of said inverter circuit; and

a series circuit, including inductance and capacitance, which is connected in parallel with one of said first and second capacitances thereby to form a parallel resonating circuit.

4,376,919

CIRCUITRY FOR SWITCHING EFFECTIVE ELECTRODE AREA ON A CRYSTAL IN A CRYSTAL OSCILLATOR TO VARY THE OSCILLATION FREQUENCY

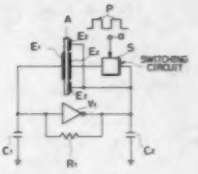
Tetsuro Konno, Tokyo, Japan, and Tetsuro Konno, Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Sep. 17, 1980, Ser. No. 188,031

Claims priority, application Japan, Oct. 16, 1979, 54-133937; Dec. 14, 1979, 54-162267; Dec. 14, 1979, 54-162267

Int. Cl.³ H03B *5/32;* **H03L** *1/02*

U.S. Cl. 331—158 **8 Claims**



1. A circuit for switching the effective electrode area on a crystal resonator in a crystal oscillator to vary the oscillation frequency, comprising:

a crystal resonator suitable for use as a frequency standard;

plural electrodes on the surface of said crystal resonator jointly defining an electrode area;

pulse generator means for generating pulses having a variable duty factor; and

switching circuit means responsive to the pulses for switching the effective electrode area on the crystal resonator for controlling the oscillation frequency of said crystal resonator.

4,376,920

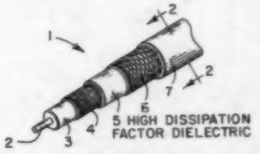
SHIELDED RADIO FREQUENCY TRANSMISSION CABLE

Kenneth L. Smith, 23 Barberry La., Meriden, Conn. 06450

Filed Apr. 1, 1981, Ser. No. 250,053

Int. Cl.³ H01P *3/06*

U.S. Cl. 333—12 **21 Claims**



1. A cable for radio-frequency transmission comprising at least one center conductor, a dielectric surrounding said conductor, and at least two generally concentric separated inner and outer metallic sheaths defining an outer transmission path therebetween having a first propagation function,

said center conductor and said inner metallic sheath defining an inner transmission path therebetween having a second propagation function,

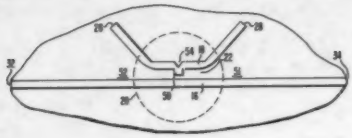
said first propagation function being significantly greater than twice said second propagation function to significantly attenuate radiation from said cable.

4,376,921

MICROWAVE COUPLER WITH HIGH ISOLATION AND HIGH DIRECTIVITY

Lawrence E. Dickens, Baltimore, and Paul H. Mountcastle, Glen Burnie, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1981, Ser. No. 258,348
Int. Cl.³ H01P 5/18
U.S. Cl. 333—116 6 Claims



1. A microwave signal coupler for coupling a microwave signal loosely from a main microstrip transmission line to a coupled microstrip transmission line with high directivity, said coupling including:

a ground plane;

a dielectric substrate layer disposed over said ground plane;

a section of each of said main and coupled microstrip transmission lines disposed on the exposed surface of said dielectric substrate layer adjacently aligned with a predetermined gap therebetween to form a coupling region, the length of said coupling region being substantially less than one-quarter wavelength of said microwave signal;

a capacitive coupling element disposed within said coupling region across said main and coupled transmission line sections for supplementing the dielectric capacitive coupling of the gap therebetween to increase the directivity of said microwave signal coupling, said capacitive coupling element splitting the coupled transmission line section of the coupling region into two branches, said capacitive coupling element being physically adjustable in size to balance the electric and magnetic field microwave signal coupling components of one of said branches and to reduce the microwave power output thereof; and

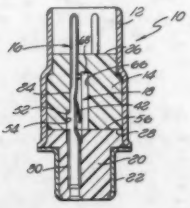
at least one of the microstrip transmission line coupling sections having a V-shaped notch removed from the width thereof on a side opposite said gap and in the proximity of said capacitive coupling element.

4,376,922

FILTER CONNECTOR

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT, New York, N.Y.

Filed Oct. 23, 1980, Ser. No. 200,051
Int. Cl.³ H03H 7/01; H01R 13/66
U.S. Cl. 333—182 5 Claims



1. An electrical connector comprising:

an insulator body having at least one row of contact cavities therein;

said insulator body comprising a front insulator and a rear insulator, said front insulator having a front face and a rear face, said rear insulator being mounted against said rear face;

said cavities extending through said front and rear insulators;

a slot in said front insulator opening to said rear face but terminating short of said front face providing a rearwardly facing stop shoulder, said slot being parallel to said row of cavities and intersecting said cavities whereby said cavities are open transversely to said slot;

a monolithic electronic element in said slot, said element being inserted into said slot from the rear of said front insulator when said rear insulator is separate from said front insulator;

said rear insulator retaining said element in said slot;

said element comprising a substrate having a plurality of parallel, spaced live electrodes on an outer face thereof facing in the direction of said cavities and aligned therewith; and

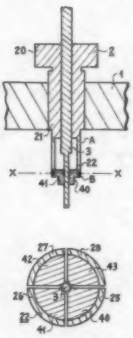
an electrical contact in each of said cavities, each said contact having a forward tubular mating section adjacent to said front face and an integral laterally outwardly extending spring finger behind said mating section engaging a respective one of said electrodes.

4,376,923

ULTRA-HIGH FREQUENCY TUNING DEVICE OF THE SLIDING CONTACT TYPE

Jean C. Curtinot; Xavier Delestre, and Jean Fouillet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 4, 1981, Ser. No. 240,286
Claims priority, application France, Mar. 5, 1980, 80 04949
Int. Cl.³ H01P 7/06, 1/207
U.S. Cl. 333—232 3 Claims



1. An ultra-high frequency tuning device for fitting in a wall of a cavity comprising:

a first cylindrical member which runs through the wall of the cavity and which is adapted to be fixed to said wall, said first member being bored by a cylindrical hole having a first cylindrical aperture in the cavity and a second aperture outside the cavity, said first member terminating towards the first aperture in n elastic longitudinal members (n being an integer at least equal to 2);

n respective contacts made from a metal which is a good conductor of electricity and fixed to the elastic members, said n contacts being located between the elastic members and the first aperture and bounding the first aperture; and

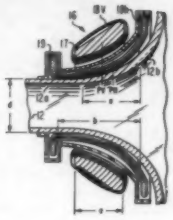
a second cylindrical member forming a moving rod for sliding through the hole and having a cylindrical part of the diameter of the first aperture, for sliding through the first aperture and penetrating the cavity by a regulatable length.

4,376,924

SELF-CONVERGING TELEVISION DISPLAY SYSTEM

Josef Gross, Princeton; William H. Barkow, Pennsauken, both of N.J., and John W. Mirsch, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,130
Int. Cl.³ H01F 5/00
U.S. Cl. 335—210 3 Claims



1. A self-converging television display system comprising:

a color television picture tube including a glass envelope having a cylindrical neck portion of a nominal outside diameter at one end of said picture tube which encloses an electron gun assembly for producing three horizontal in-line beams, said neck portion joining an outwardly flared portion of said envelope which encloses at the other end of said picture tube a faceplate having colored phosphor elements deposited on the inside surface thereof; and

a self-converging deflection yoke assembly producing a pincushion-shaped horizontal deflection field and a barrel-shaped vertical deflection field mounted in operating relationship adjacent the neck and flared portions of said tube, said yoke assembly comprising a pair of vertical deflection coils toroidally wound about a ferrite core and a pair of diametrically oppositely disposed saddle-type horizontal deflection coils disposed adjacent the inside surface of said vertical coils, each of said horizontal saddle coils having two groups of active conductor turns generally longitudinally disposed and joined at their respective front and rear end portions by respective forward and rearward groups of return conductor turns, said active and return conductor portions forming a window area of said coil,

the longitudinal dimension of said active turns adjacent said flared envelope portion being no greater than 1.2 times said neck nominal outside diameter dimension, and

said core having a longitudinal dimension no greater than said neck nominal outside diameter dimension and being disposed within the longitudinal dimension of said window area so as to be set back from the forward return conductor group and set forward from the rearward return conductor group.

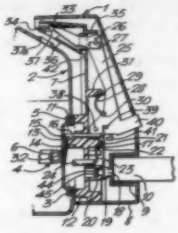
4,376,925

SWITCH UNITS FOR ELECTRIC IMMERSION HEATERS

John C. Taylor, 9 Homefield Park, Ballasalla, Castletown, Isle of Man, England

Filed Jan. 16, 1980, Ser. No. 112,797
Int. Cl.³ H01H 71/16
U.S. Cl. 337—36 7 Claims

1. A switch unit for an electric immersion heater for mounting on the wall of a liquid heating vessel, the switch unit including thermally responsive means sensitive to boiling liquid on a body of the switch unit in a position for exposure, in use, to vapour emerging from the vessel, said thermally responsive means comprising a snap-acting bimetallic actuator comprising a member of sheet bimetal having an aperture with an outer perimeter and an inner perimeter defining a tongue free at one end intermediate two lobe portions of said aperture, said inner perimeter and arcuate portions of said outer perimeter smoothly merging at rounded ends of the aperture adjacent the tongue root, the tongue being, at least in part, generally centrally disposed with respect to the member, the member having been deformed in a die pressing operation to conform in shape to a die of domed configuration, said domed area being such as to reverse its curvature with a snap action with change in temperature, and the width of the domed area being greatest in the region of the tongue root, an overcentre spring mechanism coupling said bimetallic actuator to a movable contact of an



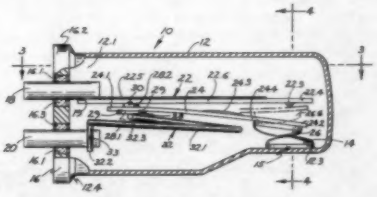
electrical switch for opening and closing said switch, said overcentre spring mechanism being movable between a first position in which said switch is closed and power can be supplied to the immersion heater and a second position in which said switch is open for interrupting the supply of power to the immersion heater, a lever of the overcentre mechanism being pivotally mounted on said body and a spring of the overcentre mechanism being mounted between fulcrums provided by said lever and said body so that the spring biasses said lever into direct or indirect engagement with said bimetallic actuator in the first position of the overcentre mechanism.

4,376,926

MOTOR PROTECTOR CALIBRATABLE BY HOUSING DEFORMATION HAVING IMPROVED SEALING AND COMPACTNESS

Ronald E. Senor, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 52,897, Jun. 27, 1979, which is a continuation of Ser. No. 856,707, Dec. 2, 1977. This application May 12, 1981, Ser. No. 262,843
Int. Cl.³ H01H 37/54
U.S. Cl. 337—104 8 Claims



1. A protector for an electrical motor having start and run windings comprising

a tubular housing of deformable, electrically and thermally conductive metal material having an open end and a closed end,

first contact means on the housing inside the housing adjacent the closed housing end,

a pair of terminal means to be electrically connected to the respective motor windings mounted in the open housing

end to extend into the housing in spaced, electrically insulated relation to each other and to the housing,

a first electrical resistance heater secured in electrically conductive relation to one of the terminal means to extend in cantilever relation therefrom along the length of the housing in spaced relation to the housing,

a thermally responsive electrically conductive bimetallic member having one end secured in electrically conductive relation to said first heater to extend in cantilever relation therefrom with one side of the member extending in heat-transfer relation to a portion of said first heater, said member having second contact means at its opposite end normally engaged with said first contact means for closing a circuit and being movable when heated to a selected temperature for disengaging the second contact means from the first contact means to open said circuit, and

a second electrical resistance heater electrically connected between the other terminal means and said thermally responsive member, said second heater having a portion thereof extending along an opposite side of the member in heat-transfer relation thereto,

whereby said heaters are compactly arranged in heat-transfer relation to the thermally responsive member to be connected in series with the respective motor windings for opening said circuit in response to the occurrence of selected current conditions in either of the windings while permitting deformation of the housing adjacent said closed end thereof for calibrating the protector.

4,376,927

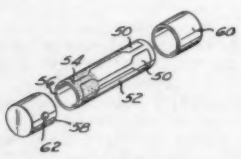
PRINTED CIRCUIT FUSE ASSEMBLY

James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705

Division of Ser. No. 970,632, Dec. 18, 1978, Pat. No. 4,296,398. This application May 28, 1981, Ser. No. 268,011

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—297 **6 Claims**



1. A circuit fuse assembly comprising:

an electrically insulating substrate;

a plurality of thin foil fuse elements bonded to said substrate and positioned in a substantially parallel orientation so as to be electrically insulated from each other;

each of said elements melting when a predetermined magnitude of electrical current passes therethrough; and

insulating means partially extending on at least one of said fuse elements adjacent one end of said substrate, said means being selectively removable to provide electrical contact to each of said fuse elements.

4,376,928

ADJUSTABLE TEMPERATURE SENSOR

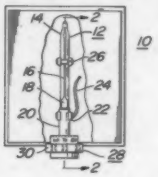
H. Nelson Bender, 314B Mink Rd., Perkasie, Pa. 18944, and Frank Bender, 421 E. Rockhill Rd., Perkiomenville, Pa. 18074

Filed Jul. 31, 1981, Ser. No. 288,870

Int. Cl.³ H01H *37/36*

U.S. Cl. 337—323 **7 Claims**

1. An adjustable temperature sensor control apparatus comprising a tube sealed from the atmosphere, said tube having a well section containing mercury and an elongate capillary section disposed above said well, a first electrical connector in contact with said mercury in said well, said first electrical connector having a set point associated therewith, a second electrical connector positioned at a fixed location in said capillary and having a fixed set point associated therewith, a stem disposed adjacent the bottom of said well, said stem in direct contact with said mercury and mechanical means to vertically



move said stem in said well to displace said mercury in said well into and up through said capillary and vice versa so as to vary the set point associated with said first electrical connector, said displacement of mercury controlled and calibrated to correspond to a desired temperature setting.

4,376,929

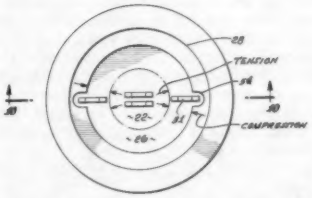
OPTIMIZED STRESS AND STRAIN DISTRIBUTION DIAPHRAGMS

Kjell E. Myhre, 941 Enterprise Ave., Inglewood, Calif. 90302

Division of Ser. No. 1,310, Jan. 5, 1979, abandoned, which is a division of Ser. No. 754,251, Dec. 27, 1976, Pat. No. 4,133,100, and a continuation-in-part of Ser. No. 6,086, Jan. 24, 1979, abandoned. This application Jan. 7, 1980, Ser. No. 110,024

Int. Cl.³ G01L *1/22*

U.S. Cl. 338—4 **52 Claims**



1. An improved transducer diaphragm for mounting around its periphery to a cylindrical spacer, said diaphragm comprising a plate having an even back surface and a multilevel front surface, which multilevel front surface includes an upper level spaced from said back surface, a lower level closer to said back surface than said upper level, and at least two symmetrically positioned recess portions at said lower level overlying a maximum strain amplitude section of the plate, and a strain gauge mounted on said lower level of the multilevel front surface in each of said recesses.

4,376,930

CALL SIGNAL CONVERSION APPARATUS FOR ELEVATOR SYSTEM

Isao Sasao, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,351

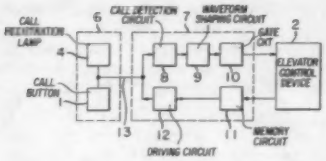
Claims priority, application Japan, Jan. 29, 1980, 55-9097

Int. Cl.³ G08B *5/36*

U.S. Cl. 340—19 R **7 Claims**

1. In a call signal conversion apparatus for an elevator system which comprises a call button device as a serial connection of a call button and a call registration lamp; a control device as a computer for inputting a call signal given by actuation of the

call button, registering the calling and outputting a call registration signal; and a signal conversion circuit connected between said button device and said control device an improvement characterized in that said signal conversion circuit comprises a call detection circuit for detecting said call signal; a waveform shaper circuit which shapes said call signal to output the signal to said control device; a memory circuit having



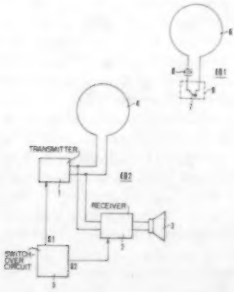
an input coupled to the control device for memorizing said call signal or said call registration signal from the control device; and a driving circuit for outputting a signal for turning on or off said call registration lamp by detecting an output of said memory circuit and for supplying a signal equivalent to said call signal to said control device through said call detection circuit and said waveform shaper circuit.

4,376,931

SYSTEM FOR DETECTING ABNORMALITY IN INTERNAL PRESSURE OF TIRE

Satoru Komatu; Sumio Kobane; Masanobu Yamamoto, all of Tokyo; Hiroshi Takahashi, Kodaira, and Terutsugu Izumo, Funabashi, all of Japan, assignors to Meisei Electric Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,590
Claims priority, application Japan, Feb. 7, 1980, 55-12988
Int. Cl.³ B60C 23/02
U.S. Cl. 340—58 **7 Claims**



1. A system for detecting abnormality in the internal pressure of a tire having a first device disposed at a wheel which includes said tire and a second device disposed at a non-rotating part, said system comprising in combination:

a. the first device which includes:

a-1. a pressure responsive element which is provided with a crystal resonator, said element being arranged to operate to cause a stress applied to said crystal resonator to be varied by variations of the internal pressure of said tire and thus to vary the natural frequency of the crystal resonator accordingly, and

a-2. a first antenna connected to said pressure responsive element; and

b. the second device which includes:

b-1. a transmitter arranged to excite said crystal resonator by sending out one after another therefrom a plurality of different exciting energies having different frequency values within a range over which the natural frequency of said crystal resonator varies when the internal pressure of the tire is within a normal range thereof,

b-2. a receiver arranged to receive an oscillatory energy which is discharged from the crystal resonator immediately after said excitation of the crystal resonator by the exciting energy from said transmitter comes to a stop with the oscillatory energy accumulated by the exciting energy at the crystal resonator and discharged therefrom immediately after the ceasing of said exciting action on the crystal resonator,

b-3. a second antenna connected to said transmitter and receiver, the second antenna being arranged to send said exciting energy to said first antenna and to receive said discharged oscillatory energy from said first antenna,

b-4. a switch-over circuit arranged to stop the exciting energy sending out action of said transmitter after the exciting energy is sent out from the transmitter and to allow said receiver to begin the receiving action thereof, and

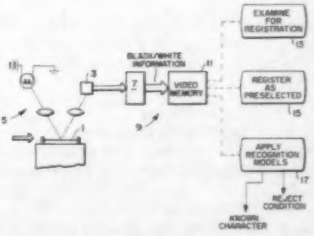
b-5. an alarm circuit connected to said receiver, said alarm circuit being arranged to announce abnormality when the abnormality is detected by the receiver, the abnormality being determined on the basis that the oscillation frequency of the discharged oscillatory energy comes outside of a preset range of oscillation frequency.

4,376,932

MULTI-REGISTRATION IN CHARACTER RECOGNITION

Thomas E. Cassada, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,130
Int. Cl.³ G06K 9/68
U.S. Cl. 382—44 **12 Claims**



1. A method of optical character recognition comprising:

(1) storing in data processing memory conditions defining an image,

(2) electronically comparing said stored image against a first identification model with said stored image in one perspective selected from perspectives referenced to a central area of said image and perspectives referenced to a border area of said image, and

(3) electronically comparing said stored image against a second identification model with said stored image in a different perspective selected from perspectives referenced to a central area of said image and perspectives referenced to a border area of said image, said second identification model having identification information differing essentially from the identification information of said first identification model.

4,376,933

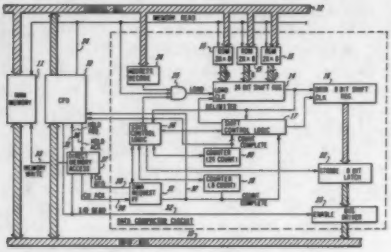
CIRCUIT FOR COMPACTING DATA

Amitabh Saran, Cypress; Guillermo F. Luzio, Huntington Beach, both of Calif., and Frank A. Betron, Plano, Tex., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 9,002, Feb. 23, 1979, abandoned. This application May 23, 1980, Ser. No. 152,969

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD 13 Claims



1. A circuit for compacting variable length data into a fixed word length format comprising:

an m bit per word memory for storing and outputting variable length data words, said m bits comprising a variable length data word, unused bits and a delimiter bit to mark the boundary between said data word and said unused bits,

an m bit shift register for serially receiving the contents of said m bit shift register,

an n bit shift register for serially receiving the contents of said m bit shift register,

means for preventing the loading of said unused bits and said delimiter bit into said n bit shift register as said bits are shifted out of said m bit register,

a counter responsive to the count of bits remaining in said m bit shift register for enabling said memory to load an m bit next word into said m bit shift register after the previous m bit register contents have been completely shifted out, and

a counter responsive to the count of bits loaded into said n bit register for enabling said n bit register to output its contents in parallel after serially receiving n bits of data.

4,376,934

DISPLAY SYSTEM

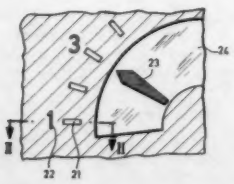
Hans Prohaska, and Horst Rachner, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 23, 1980, Ser. No. 171,473

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931327

Int. Cl.³ G01D *13/04*

U.S. Cl. 340—815.17 17 Claims



1. In a display system, especially adapted for motor vehicles, comprising at least one display element containing means for indication of a changing measured value, said means being associated with a scale in such a way that the actual size of the measured value shown by the display element may be recognized, said display element being implemented by an electro-optical cell filled with a liquid, said cell having two transparent plates separated by a distance frame and provided with transparent electrodes, said cell having an associated illuminating device at the back side, the improvement in which portions of one of the said transparent plates are rendered opaque, the remaining areas on said one plate providing transparent windows, transparent areas being provided between the plates, one of said transparent areas having a contour corresponding with the contour of the scale and the other of said transparent areas having a larger area than the area having the scale contour.

4,376,935

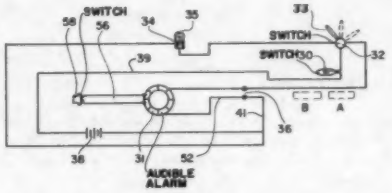
HANDBAG UTILIZING AUTOMATICALLY FUNCTIONING ILLUMINATION AND ALARM DEVICES

Stanley C. Castaldo, 704 N. Lake Pleasant Rd., Apopka, Fla. 32703

Filed Aug. 10, 1981, Ser. No. 291,273

Int. Cl.³ G08B *13/14*

U.S. Cl. 340—571 19 Claims



1. An electrical arrangement for a purse or handbag, comprising a switch unit having at least one electrical terminal on its exterior, and a magnetically operable switch in its interior connected to said electrical terminal; and a magnet used in conjunction with said switch unit, means for mounting said switch unit on one wall of the handbag, and means for mounting said magnet on another wall of the handbag in a position opposite, and in substantial alignment with, said switch unit; and an electrical source connected to said magnetically operable switch and to said electrical terminal such that when said switch is in a closed condition, current will flow from said source to an electrical device connected to said electrical terminal, said magnet being supportable in at least two different positions on said magnet mounting means, such that when in a first position, it can interact with said magnetically operable switch as the handbag is opened or closed, and when in a second position on said magnet mounting means, it is disposed sufficiently far away from said magnetically operable switch as not to interact therewith as the handbag is opened or closed.

4,376,936

SEARCH SYSTEM FOR RANDOMLY CLASSIFIED OBJECTS

Jacques Kott, 61, rue Bagnolet, 75020 Paris, France

Filed Oct. 6, 1980, Ser. No. 194,026

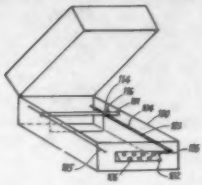
Claims priority, application France, Oct. 5, 1979, 79 24818

Int. Cl.³ H04Q *9/00*; G06K *13/20*

U.S. Cl. 340—825.3 5 Claims

1. A system for the search for randomly classified objects, each object being movable and having a classification code, comprising a central control device for emitting a signal corresponding to the code of the object which is sought, an independent locating device fixed on each object and adapted to be connected with the control device whatever is the place of the object in a filing device, the locating device comprising a memory device wherein has been stored the classification code

of the object, a comparison device for comparing the code contained in the memory device with the code obtained from



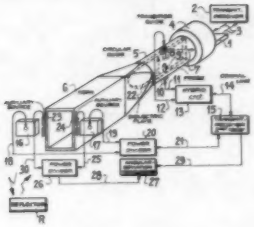
the signal emitted by the control device and an indicator device operating upon coincidence of the two codes.

4,376,937

ANTENNA FOR PRIMARY AND SECONDARY RADARS

Georges Cohen, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 2, 1980, Ser. No. 183,066
Claims priority, application France, Sep. 7, 1979, 79 22450
Int. Cl.³ G01S *13/44;* H01Q *21/29*
U.S. Cl. 343—16 M 5 Claims



1. In a radar system for the monitoring of air traffic, including a primary-radar transceiver, a secondary-radar transceiver, a reflector, a primary feeder confronting said reflector and comprising in succession a rectangular waveguide connected to the primary-radar transceiver for carrying high-frequency wave energy therebetween, a matching waveguide, a circular waveguide with a cylindrical section, and a rectangular horn extending from said circular waveguide toward said reflector, two probes arranged at diametrically opposite locations in said cylindrical section, said probes having a common axis which includes an angle of not more than about 45° with the planes of the major sides of the rectangular horn, said probes being connected to the secondary-radar transceiver for exchanging interrogation signals therewith, two ancillary feeders facing said reflector in symmetrical positions on opposite sides of the rectangular horn, and a power divider inserted between the secondary-radar transceiver and said ancillary feeders for supplying same with phase-opposed control signals to be radiated toward said reflector for transmission to an aircraft along with said interrogation signals,

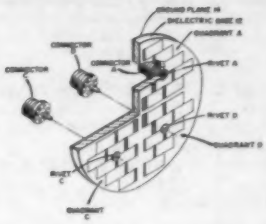
the combination therewith of a monopulse channel carrying incoming signals from transponders aboard the interrogated aircraft, said monopulse channel including a pair of auxiliary sources flanking said horn and confronting said reflector in a common azimuthal plane with said ancillary feeders, and angular-deviation-measuring means with inputs connected to said auxiliary sources and to said probes for respectively receiving therefrom a difference signal and a sum signal of said monopulse channel.

4,376,938

WIRE GRID MICROSTRIP ANTENNA

John F. Toth, Billerica; Richard J. Conti, Belmont; Nunzio M. Cavallaro, Lawrence, and Thomas B. Dowling, Lowell, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 17, 1980, Ser. No. 141,022
Int. Cl.³ H01Q *1/38*
U.S. Cl. 343—700 MS 4 Claims



1. A planar array antenna for radio frequency energy wherein the strip conductor of a microstrip line is disposed on a surface of a dielectric base to form a mesh of rectangles having openings equal to L×L/2, where L is equal to the wavelength of the radio frequency energy, the centers of shorter sides of the sides defining adjacent openings of such mesh defining a triangular grid, such array comprising:

(a) means for amplitude tapering the radio frequency energy radiated from the shorter sides of the sides defining the openings in the mesh of rectangles; and

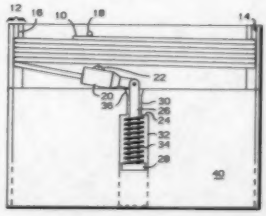
(b) means for feeding radio frequency energy to the mesh of rectangles.

4,376,939

POSITIVE LOCK FOR DEPLOYABLE WHIP ANTENNAS

James B. Reid, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 190,676, Sep. 25, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,735
Int. Cl.³ H01Q *1/32*
U.S. Cl. 343—715 5 Claims



1. A positive lock for deployable whip antennas comprising:

(a) a base having a cavity with at least one external opening, said cavity having an axis passing through said external opening;

(b) means for storing and releasing energy within said cavity;

(c) a plunger having a first end external to said cavity and a second end internal to said cavity, said plunger being responsive to said means for storing and releasing energy such that said first end of said plunger is pulled into said cavity when said means for storing and releasing energy releases energy;

(d) means for triggering release of energy from said means for storing and releasing energy; and,

(e) a ferrule pivotally mounted on said first end of said plunger, said ferrule being capable of assuming at least a

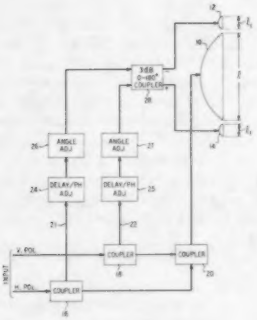
first position external to said cavity and out of alignment with said axis of said external opening and a second position at least in part within said cavity and in alignment with said axis of said cavity so that when said first end of said plunger is pulled into said cavity said ferrule is pulled from said first position external to said cavity and out of alignment with said axis of said external opening to said second position at least in part within said cavity and in alignment with said axis of said cavity so that motion of said ferrule laterial to said axis is restricted.

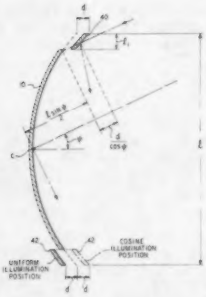
4,376,940

ANTENNA ARRANGEMENTS FOR SUPPRESSING SELECTED SIDELOBES

Hotze Miedema, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1980, Ser. No. 201,822
Int. Cl.³ H01Q *3/26*
U.S. Cl. 343—840 **8 Claims**





1. An antenna arrangement capable of suppressing selected sidelobes, the antenna arrangement comprising:

a main antenna (**10**) comprising a main focusing reflector including a predetermined aperture (l) and a feed arrangement disposed to radiate a first beam of electromagnetic energy when emitted therefrom along a feed axis of the main antenna for reflection by the main focusing reflector toward the aperture thereof with a predetermined amplitude distribution thereacross

characterized in that

the antenna arrangement further comprises:

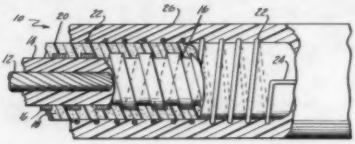
first and second suppression means (**12**, **14**, **40** and **42**) disposed adjacent to and on symmetrically opposite sides of the main focusing reflector in the plane of the sidelobes to be suppressed with a distance therebetween that approximates the width of the aperture of the main focusing reflector, the first and second suppression means being capable of directing second and third beams, respectively, of electromagnetic energy in the direction of the first beam with a radiation pattern which comprises an amplitude and periodicity which corresponds to, and a phase opposite to, the selected sidelobes to be suppressed.

4,376,941

ANTENNA CABLE

Joseph A. Zenel, Princeton, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1970, Ser. No. 14,829
Int. Cl.² H01Q *1/34*
U.S. Cl. 343—709 **7 Claims**



1. A flexible antenna cable structure adapted to be streamed aft from a submarine for use in E.L.F. radio reception, said antenna cable structure comprising:

a flexible, metallic, central strength member;

a first layer overlying said strength member and formed of a flexible, electrically insulating, waterproof material;

a second layer overlying said first layer and formed of a resilient, electrically insulating foam material;

distributed loop antenna means disposed on said second layer; and

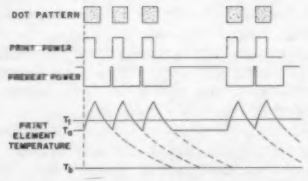
a third layer surrounding said distributed loop antenna means and said second layer, said third layer being formed of a resiliently flexible, waterproof, and electrically insulating material.

4,376,942

THERMAL PRINTING SYSTEM

John E. Toth; Wayne M. Spani; Chandler R. Deming, and Anthony W. Cumo, all of San Diego, Calif., assignors to Cubic Western Data, San Diego, Calif.

Filed Dec. 1, 1980, Ser. No. 211,025
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



1. A thermal printing system for rapidly printing alphanumeric information in dot matrix format consisting of a plurality of columns of dots on stock coated with material having a predetermined threshold temperature at which it changes color, comprising;

a print head including a plurality of print elements arranged in a row, each print element adapted to be selectively heated in an amount proportional to the amplitude of an electric current made to flow therethrough;

means for supporting and propelling the stock past the print head adjacent to the print elements and in a direction extending generally perpendicular to the row of print elements;

control means for receiving commands representative of the

format and the text of the alphanumeric information to be printed and for decoding the commands and storing data representative of the columns of dots to be printed; and

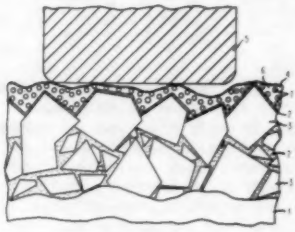
driver means responsive to the control means for causing each column of dots to be printed by sequentially causing a preheat current, a print current and zero current to flow through a first portion of the print elements and the preheat current to continuously flow through a second remaining portion of the print elements, the amplitudes of the preheat current and the print current being sufficient so that the temperature of the print elements of the first portion rapidly fluctuates above and below the threshold temperature whereby the columns of dots can be printed in rapid succession.

4,376,943

RECORD CARRIER FOR AN ELECTRO-EROSION PRINTER AND METHOD FOR MAKING SAME

Dietrich J. Bahr, Herrenberg, and Marian Briska, Böblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1981, Ser. No. 274,964
Int. Cl.³ G01D *15/24*
U.S. Cl. 346—135.1 **9 Claims**



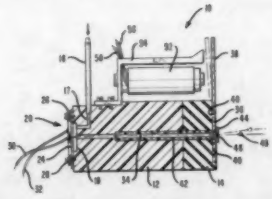
1. A record carrier for an electro-erosion printer, said carrier coprising a base material coated with a lacquer layer containing a pigment, said lacquer layer being covered in turn by a thin metal layer comprising, aluminum, characterized in that the roughness of the metal layer surface caused by the pigment contained in the lacquer layer (2,6) has a high frequency, a low amplitude, and a soft, rounded-off waviness practically without edges or steps.

4,376,944

INK JET PRINT HEAD WITH TILTING NOZZLE

Peter H. Reitberger, Munich, and Wilhelm Ruprich, Augsburg, both of Fed. Rep. of Germany, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 13, 1981, Ser. No. 253,977
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **14 Claims**



1. An ink jet print head including a

body having a resilient portion secured on the face thereof, an

ink fluid supply, a

nozzle for ejecting droplets of ink from the face of said body,

means for moving ink fluid along a path from said supply through said resilient portion and to said nozzle, and

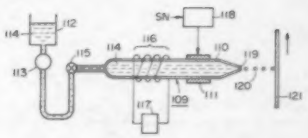
means including an elongated member carrying said nozzle on the face thereof and an actuator supported from the body adjacent the resilient portion, said elongated member having a portion extending beyond said body and positioned to be movable by said actuator for rapidly tilting said nozzle against the resilient portion and relative to said path for changing the direction of droplets of ink ejected from the nozzle during printing operation.

4,376,945

INK JET RECORDING DEVICE

Toshitami Hara, Tokyo; Yasushi Sato, Kawasaki; Yasuhi Takatori, Machida, and Yoshiaki Shirato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 87,801, Oct. 24, 1979, Pat. No. 4,296,421.
This application May 27, 1981, Ser. No. 267,650
Claims priority, application Japan, Oct. 26, 1978, 53-131860; Oct. 26, 1978, 53-131861; Oct. 30, 1978, 53-133376; Nov. 14, 1978, 53-140111; Nov. 14, 1978, 53-139978; Nov. 14, 1978, 53-139979; Dec. 4, 1978, 53-150377; Dec. 15, 1978, 53-156102; Dec. 20, 1978, 53-157148; Dec. 27, 1978, 53-165883
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **26 Claims**



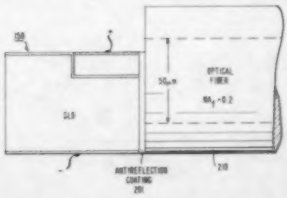
1. A device for recording comprising a liquid chamber for holding a liquid recording medium and having a discharging orifice; heating means for heating the liquid recording medium in the liquid chamber and for ejecting the liquid recording medium from the discharging orifice, and an adhesive for adhering a plurality of components of said device together, said adhesive being capable of forming a three dimensional network structure.

4,376,946

SUPERLUMINESCENT LED WITH EFFICIENT COUPLING TO OPTICAL WAVEGUIDE

Ivan P. Kaminow, Tinton Falls, and Dietrich Marcuse, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 28, 1980, Ser. No. 211,231
Int. Cl.³ H01S *3/18*
U.S. Cl. 357—17 **7 Claims**



1. In combination, an edge-emitting, superluminescent light-emitting diode having an active layer with a pumped region of length L, and an output optical waveguide system having a core diameter greater than the width of the light-emitting

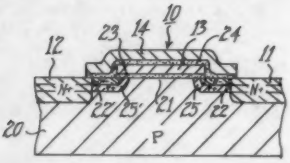
region of said diode and a numerical aperture of NA_f characterized in that the refractive indexes in said active layer adjacent to said pumped region in said superluminescent light-emitting diode are chosen to provide lateral confinement of light in the active layer of said diode to a waveguide region having a width D and a lateral numerical aperture NA_g substantially equal to the numerical aperture NA_f of said output optical waveguide system, the parameter nD/2L being much less than the numerical aperture, NA_g where n is the effective refractive index in the light-emitting region of said diode.

4,376,947

ELECTRICALLY PROGRAMMABLE FLOATING GATE SEMICONDUCTOR MEMORY DEVICE

Te-Long Chiu, Houston, and Jih-Chang Lien, Sugar Land, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 4, 1979, Ser. No. 72,504
Int. Cl.³ H01L *29/78*; G11C *11/40*
U.S. Cl. 357—23 **3 Claims**



1. An electrically programmable, nonvolatile, floating gate semiconductor memory cell comprising: an MOS transistor device formed in a face of a semiconductor body of one type and having a deep source and a deep drain of the opposite type as well as a shallow source and shallow drain of said opposite type, a channel area between said shallow source and drain, a floating gate and a control gate overlying the channel area, the control gate larger than the floating gate and the deep source and deep drain being self-aligned with the control gate, and

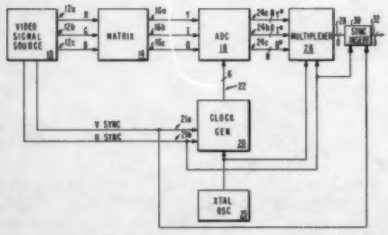
a region of said one type doped more heavily than said body adjacent said shallow drain occupying part of the channel area but not all of the channel area, said region being self-aligned with said floating gate.

4,376,948

TDM SCHEME FOR DIGITAL VIDEO PROCESSING

Robert A. Dischert, Burlington; James J. Williams, Jr., Plainsboro, and Glenn A. Reitmeier, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,596
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—13 **21 Claims**



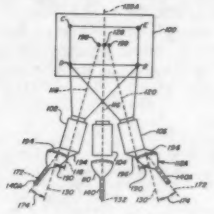
1. A method for time multiplexing three component signals representing a television picture, said method comprising sampling said component signals with a frequency ratio of 2:1:1 respectively, each component signal having a phase shifted sampling clock from line to line, the lower sampling frequency component signals having a mutual phase shift of the sampling clock on corresponding lines, time delaying the samples of the lower sampling frequency component signals on alternate lines, and applying the delayed and undelayed samples of the lower sampling frequency component signals and the samples of the higher sampling frequency component signal to a single channel.

4,376,949

COLOR PROJECTION TV SYSTEMS

William A. Rowe, Palatine, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 11, 1981, Ser. No. 272,581
Int. Cl.³ H04N *5/74*
U.S. Cl. 358—60 **16 Claims**



1. In an image projection system of the type comprising:

a projection screen defining a normal axis;

lens means having an optical axis, and arranged to focus a projected image upon a surface of said screen;

said lens means being skewed so that its optical axis is at an acute angle to said screen axis whereby the plane of said projected image has a tendency to be be rotated out of coincidence with said screen surface;

and image source means having an object image surface and being arranged to provide upon said object image surface an object image for said lens means to project;

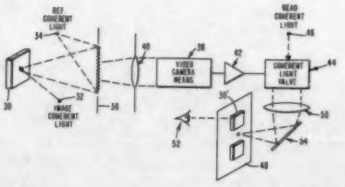
the improvement wherein said image source means is oriented so that said object image surface is angularly displaced from a position of normality relative to said optical axis to the degree necessary to rotate said projected image plane into substantial coincidence with said screen surface.

4,376,950

THREE-DIMENSIONAL TELEVISION SYSTEM USING HOLOGRAPHIC TECHNIQUES

Hugh B. Brown, Fremont; Stephen C. Noble, Santa Clara, and Bob V. Markevitch, Palo Alto, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sep. 29, 1980, Ser. No. 191,727
Int. Cl.³ H04N *9/54*
U.S. Cl. 358—90 **2 Claims**



1. A holographic television system for generating three-dimensional images of selected subject matter, comprising:

optical means for generating in real time an area hologram of the subject matter;

electrooptical means coupled to the optical means for generating in real time an electrical video signal corresponding to the area hologram;

electrical-to-optical transducer means coupled to the electrooptical means and including cathode ray tube means having a scanning electron beam, for continuously generating in real time successive images of the area hologram in response to modulation by the electrical video signal;

optical-to-optical transducer means including liquid crystal light valve means for continuously optically storing in real time the successive images;

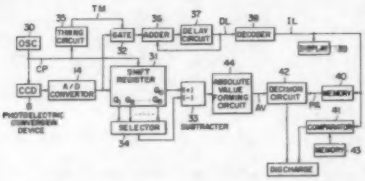
fiber optic coupling means disposed between the cathode ray tube means and the liquid crystal light valve means; and

readout means including polarizing beam splitter means and a continuous read coherent light beam for continuously illuminating the holographic image to reconstruct the hologram as a three-dimensional image of the subject matter.

4,376,951
FOREIGN MATTER DETECTING DEVICE

Takashi Miyazawa, Funabashi, Japan, assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 77,242, Sep. 19, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 206,219
Claims priority, application Japan, Sep. 29, 1978, 53-120073
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—106 **16 Claims**



1. A device for detecting a foreign matter on an object such as a bottle to be inspected which comprises a light source from which light is applied to said object; a photoelectric conversion device having a number of light receiving elements to which light passed through said object is applied; and a video signal processing device for successively subjecting to comparison and discrimination of detection signals each of which is detected at variable two adjacent points of said object thereby, said video signal processing device discriminating the variations in magnitude of said detection signals at said variable two adjacent points to detect the presence or absence of a foreign matter on said object.

4,376,952
NOISE RESPONSIVE AUTOMATIC PEAKING CONTROL APPARATUS

Anthony Troiano, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,627
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—166 **4 Claims**

1. Peaking control apparatus, comprising:

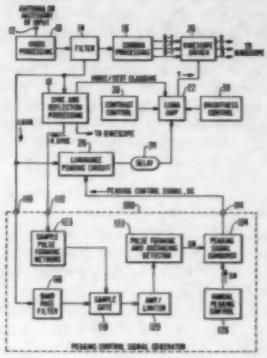
signal source means for providing a luminance signal inclusive of a noise component;

peaking means responsive to said luminance signal and to a peaking control signal supplied thereto for providing a variably peaked luminance output signal;

bandpass filter means having a passband within a midband portion of the luminance signal band and inclusive of said noise component and said filter means being coupled to said signal source means for providing a bandpass filtered luminance noise signal;

sampling means for sampling said bandpass filtered luminance noise signal solely during the horizontal blanking interval thereof to produce a sampled noise signal substantially devoid of active video components;

detector means responsive to said sampled noise signal for producing a detector output signal corresponding to the



peaks of said sampled noise signal for providing a noise level indicating signal substantially independent of luminance signal transitions which occur during said horizontal blanking interval;

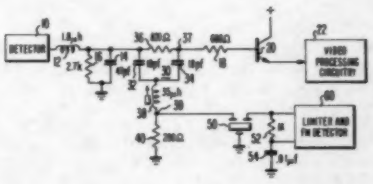
and

circuit means responsive to said noise level indicating signal for supplying said peaking control signal to said peaking means.

4,376,953
SIGNAL SEPARATION NETWORKS

Saiprasad V. Naimpally, 9133 Bourbon St., Indianapolis, Ind. 46236

Filed Oct. 26, 1979, Ser. No. 85,312
Int. Cl.³ H04N *5/62, 5/60*
U.S. Cl. 358—197 **9 Claims**



1. In a television receiver having a common detector for producing, at an output, detected video frequency signal components and an intercarrier sound signal having a given center frequency, means, having an input terminal, for processing said video frequency signal components; means, having an input, for processing said intercarrier sound signal; and a bandpass filter tuned to said intercarrier sound center frequency, exhibiting a given input impedance, and having an input, and an output coupled to the input of said intercarrier sound signal processing means; a network for separating said video and intercarrier sound signal components comprising:

a first signal path coupled between the output of said detector and the input terminal of said video signal processing means;

a second signal path coupled in parallel with said first signal path and including a first reactive impedance element of one sign;

a third signal path, including a second reactive impedance element of an opposite sign, coupled between said second signal path and the input of said bandpass filter; and

a fourth signal path coupled between the junction of said third signal path and the input of said bandpass filter and a point of reference potential and having an impedance which is substantially less than the impedance of said third signal path and the given input impedance of said bandpass filter at said intercarrier sound center frequency, such that the input impedance of said bandpass filter has substantially no effect on the response of said network at said input terminal,

wherein said first, second, third and fourth signal paths comprise a tuned circuit for attenuating said intercarrier sound signal at said input terminal.

4,376,954

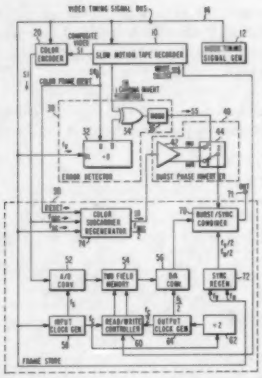
SLOW DOWN PROCESSOR FOR VIDEO DISC MASTERING HAVING COLOR PHASE ERROR DETECTOR/CORRECTOR

Michael D. Ross, Somerdale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1980, Ser. No. 215,188

Int. Cl.³ H04N *9/491*

U.S. Cl. 358—312 **6 Claims**



1. A slow down processor, comprising, in combination:

tape recorder means operable in a slow motion playback mode for producing a redundant field composite video signal comprising sequential sets of fields, each field being produced at a standard field rate, each set of fields normally comprising a predetermined number of similar fields but being subject to anomalous variations of the number of fields per set;

frame storage means, responsive to said redundant field video signal and to a control signal produced by said tape recorder means, for storing a selected field of each set of fields and for reproducing the stored selected fields at a field rate less than said standard field rate to provide a non-redundant field video output signal of reduced bandwidth, said frame storage means being of a type in which the color burst component of composite video signal supplied thereto is not stored but is regenerated by color subcarrier regenerator means and added by adder means to the reproduced video output signal;

detector means responsive to a signal manifestation produced by said tape recorder means for detecting selected ones of said anomalous variations of the number of fields per set and producing a control signal; and

inverter means responsive to said control signal for inverting the phase of the regenerated color burst component of said non-redundant video output signal when said control signal is present.

4,376,955

TWO DIMENSIONAL ADAPTIVE DROPOUT COMPENSATOR AND CHROMA INVERTER

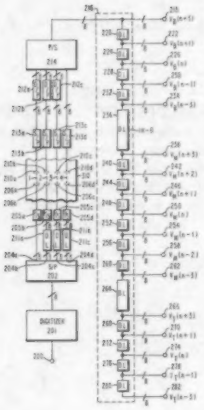
Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,811

Claims priority, application United Kingdom, Feb. 28, 1980, 8006722

Int. Cl.³ H04N *9/491, 5/78*

U.S. Cl. 358—314 **10 Claims**



1. A method for correcting dropped-out samples of recorded data, said method comprising computing the difference between samples in one direction with respect to the dropped out sample, computing the difference between samples in at least one other direction with respect to the dropped out sample, and computing an average of data from one of said directions in accordance with whichever of said differences is less.

4,376,956

VIDEO DISC PLAYER HAVING TIMEBASE CORRECTION AND CONSTANT ANGULAR VELOCITY TURNTABLE

Kevin C. Kelleher, Plainfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,280

Int. Cl.³ H04N *5/76;* **G11B** *21/02*

U.S. Cl. 358—322 **7 Claims**

1. A video disc player, comprising, in combination:

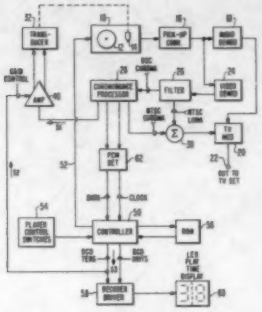
turntable means for rotating a video disc record at a predetermined substantially constant angular velocity;

transducer means for recovering a recorded signal from said record;

signal processing means responsive to a first component of the recovered signal for producing a timebase error correction signal;

feedback means for applying said timebase error correction signal to said transducer means in a sense to minimize timebase errors of said recovered signal thereby forming a closed loop servo system, said system tending to exhibit a

loop gain dependent upon the radial position of said transducer with respect to said record; and



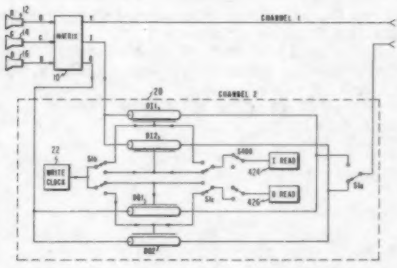
loop gain regulating means responsive to a second component of said recovered signal for regulating the loop gain of said closed loop servo system.

4,376,957

TRANSMISSION SYSTEM WITH SEQUENTIAL TIME-COMPRESSED BASEBAND COLOR

Robert A. Dischert, Burlington, and Robert E. Flory, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,107
Int. Cl.³ H04N 5/79
U.S. Cl. 358—334 **10 Claims**



1. An improved multichannel television signal record system, in which luminance information is recorded separately from chrominance information, and wherein said chrominance information comprises first and second signal components, comprising:

a first channel for recording luminance signals;

a second channel for recording said chrominance information, said second channel being subject to nonlinearities which may cause cross-modulation between said first and second signal components of said chrominance information when said first and second signal components are processed concurrently;

wherein the improvement comprises:

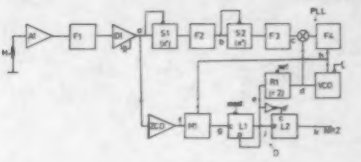
switching means coupled to said second channel for alternately coupling said first and second signal components of said chrominance information for recording in said second channel whereby said first and second signal components are processed alternately rather than concurrently thereby eliminating said cross-modulation.

4,376,958

MODIFIED FREQUENCY MODULATION

Archibald M. Pettigrew, Glenrothes, Scotland, assignor to Elcomatic Limited, Glasgow, Scotland

Filed Jul. 8, 1980, Ser. No. 166,777
Claims priority, application United Kingdom, Jul. 10, 1979, 7924057; Dec. 28, 1979, 7944454; Mar. 11, 1980, 8008108
Int. Cl.³ G11B 5/09
U.S. Cl. 360—41 **18 Claims**



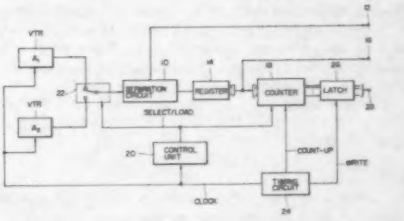
1. A method of decoding MFM information comprising the steps of deriving an information-carrying data signal from a recording medium, mathematically squaring without saturation said data signal to provide a squared data signal, mathematically squaring without saturation said squared data signal, passing said twice squared data signal to a phase lock loop to derive a coherent clock signal, halving the frequency of said coherent clock signal, multiplying the half frequency clock signal with said data signal, and recovering an information signal from said multiplied signal.

4,376,959

ADDRESS SIGNAL GENERATOR FOR PRERECORDED SIGNAL SOURCES

Toshinori Mori; Yoshiyuki Tsuchikane, and Takashi Matsushige, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Sep. 18, 1980, Ser. No. 188,274
Claims priority, application Japan, Sep. 18, 1979, 54-119615
Int. Cl.³ G11B 5/00
U.S. Cl. 360—72.2 **8 Claims**



1. A circuit arrangement for use with a plurality of synchronized sources of prerecorded signals including information data which occur synchronously with a common time base in the plural synchronized sources and address data indicating the location of said information data with respect to time, comprising:

means for separating said address data from said information data to derive an address signal;

means for selectively connecting a selected one of said signal sources to said separating means;

a register responsive to the separated address signal;

at least one binary counter responsive to the separated address signal in the register to be set to a count value commensurate with the separated address signal in said register following the establishment of each connection of the selected signal sources to said separating means; and

means for changing said count value by one binary count at

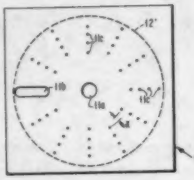
regular intervals in synchronism with the generation of said address data.

4,376,960

FLEXIBLE DISK STABILIZING STRUCTURE

Kenneth N. Karol, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,951
Int. Cl.³ G11B 5/016, 5/82
U.S. Cl. 360—99 3 Claims



1. Apparatus for magnetically recording and reproducing electrical signals, comprising

a flexible disk having a magnetic recording material on at least one surface thereof;

a Bernoulli plate member positioned adjacent said disk surface having the magnetic recording material thereon;

said plate member being concave in one direction and having a plurality of orifices therein through which air is drawn when said disk is rotating;

said orifices being aligned radially outwardly from the center of said plate member, adjacent radial lines of said orifices being offset radially from each other,

said plate member having a transducer opening therein for location of transducing means to magnetically cooperate with said disk in a non-contact transducing relationship.

4,376,961

MAGNETIC DRUM/HEAD SYSTEM FOR SELECTIVELY GENERATING RECORDED VOICE INFORMATION

Michihiro Torii, Hamamatsu; Takao Moritomo; Kouichirou Suzuki, both of Arai; Tadashi Yoshino, Hamamatsu; Norifumi Itoh, Shizuoka, and Tetsuya Suzuki, Tawara, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,672
Claims priority, application Japan, Jun. 3, 1980, 55-76878[U]; Jun. 3, 1980, 55-76879[U]; Jun. 18, 1980, 55-85476[U]; Jun. 18, 1980, 55-85477[U]
Int. Cl.³ G11B 5/55, 15/18, 5/00
U.S. Cl. 360—106 11 Claims

1. Magnetic drum/head system for selectively generating a recorded voice information comprising:

a. a magnetic drum having a magnetic layer on a circumference of a cylindrical drum body, said magnetic drum having a recording zone occupying a substantial circumference of said magnetic drum and a non-recording zone between a starting end of the recording zone and an terminating end of said recording zone,

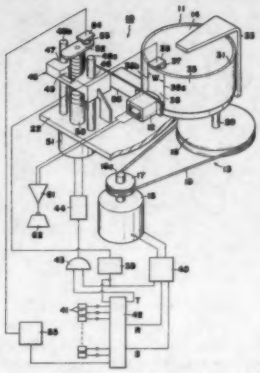
b. driving means for selectively rotating said magnetic drum,

c. a magnetic head contacting with an information track formed on said magnetic drum for generating the recorded voice information,

d. a carriage for holding said magnetic head in an abutment relation to said magnetic drum,

e. detection means for detecting said non-recording zone being in a predetermined position so that said magnetic drum is stopped with the non-recording zone thereof being in a confronting relation to said magnetic head,

f. carriage driver means for selectively moving said carriage relative to said magnetic drum when said magnetic head is in a confronting relation to said non-recording zone, thereby shifting the position of said magnetic head to a selected information track of said magnetic drum, and



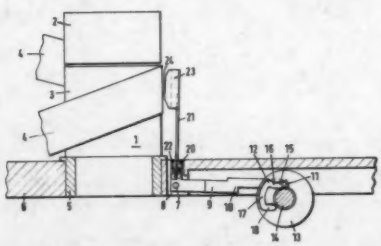
g. electric circuit means for amplifying and voicing the recorded information.

4,376,962

AUTOMATIC THREADING MAGNETIC TAPE RECORDING APPARATUS, PARTICULARLY VIDEO TAPE RECORDER

Peter Gunschmann, Darmstadt, and Theo Wolf, Rossdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stattgart, Fed. Rep. of Germany

Filed Nov. 13, 1980, Ser. No. 206,567
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948196
Int. Cl.³ G11B 15/22, 15/66, 15/60
U.S. Cl. 360—130.32 8 Claims



1. Magnetic tape recording apparatus, particularly for video tape having

a cylindrical scanning device (1) over which the tape (4) is guided in a spiral path,

and comprising, in accordance with the invention,

means (21–24) selectively engageable with the tape for pressing the tape (4) against the scanning device (1),

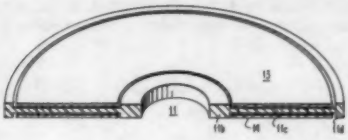
and means (7–18, 20) for selectively moving said pressing means in engagement with the tape and hence to press the tape against the scanning device for locking the tape against the scanning device to prevent movement with respect thereto.

4,376,963

COMPOSITE MAGNETIC RECORDING DISK

Jack P. Knoop, San Jose; Joel R. Weiss, and James C. Uy, both of Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1980, Ser. No. 218,339
Int. Cl.³ G11B 5/82
U.S. Cl. 360—135 7 Claims



1. A substrate for a magnetic recording disk structure, comprising,

a rigid silicon disk having a thickness no greater than 0.025 inches,

an annular shaped core member formed of a polymeric material, said polymeric material having high rigidity and tensile strength and low elongation, bonding means for bonding one surface of said silicon disk to said core member,

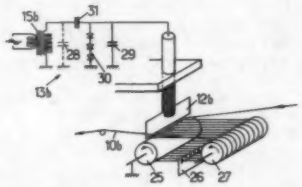
the other surface of said silicon disk being adapted to receive a magnetic recording material to form a magnetic recording member.

4,376,964

ELECTRICAL TREATMENT OF TEXTILE YARN OR FIBERS

Max Goldman; Daniel Le Fur, both of Gif sur Yvette, and Michel Sotton, Boulogne sur Seine, all of France, assignors to Electricite de France (Service National), France

Filed Feb. 24, 1981, Ser. No. 237,707
Claims priority, application France, Feb. 28, 1980, 80 04481
Int. Cl.³ H05F 3/02
U.S. Cl. 361—233 11 Claims



1. A process for treating textile yarns by electric discharge, comprising circulating a yarn through a predetermined location between two electrodes, applying an increasing voltage across said electrodes until an arc is struck between said electrodes, quenching said arc and repeating said arc striking and quenching at a high frequency, the time period between two successive ones of said arcs being greater by at least one order of magnitude than the duration of an individual one of said arcs.

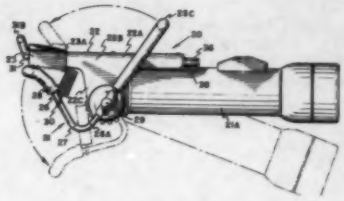
4,376,965

CLAMPING LIGHT CONSTRUCTION AND CLAMPING MEANS THEREFOR

Joseph G. Bacevius, 780 Bridgeport Ave., Shelton, Conn. 06484

Filed Dec. 26, 1979, Ser. No. 107,373
Int. Cl.³ H04M 1/22
U.S. Cl. 362—191 22 Claims

1. A clamping light construction comprising a first jaw forming member including a main clamp housing having a front gripping jaw portion; a second jaw forming member including a bail member which is angularly bent intermediate the ends thereof whereby one end defines a jaw portion deposed opposite said front gripping jaw portion of said first jaw forming member, and the other end of said bail member extending to the opposite side of said first jaw forming member defining a handle, means for pivoting said bail member intermediate the ends thereof to said first jaw forming member



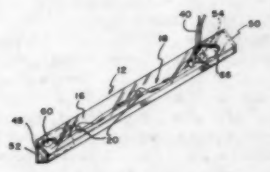
whereby said jaw portion of said bail member is rendered pivotally mounted for movement relative said front gripping jaw portion of said first jaw forming member, spring means disposed between said first jaw forming member and said second jaw forming member for normally biasing said jaw portion of said bail member toward said front gripping jaw portion of said first jaw forming member, means defining a holder operatively associated with said first jaw forming member, and a light means supported in said holder.

4,376,966

STRIP LIGHTS AND METHOD OF MAKING SAME

Dwayne A. Tieszen, Wichita, Kans., assignor to Vista Manufacturing, Inc., Elkhart, Ind.

Filed Apr. 7, 1980, Ser. No. 138,203
Int. Cl.³ F21V 15/00, 31/02
U.S. Cl. 362—249 14 Claims



1. For use in a strip light, a pair of insulated electrical conductors in closely spaced side by side relationship, a plurality of electric lamps spaced along said pair of conductors, each of said lamps having a pair of oppositely extending electric leads disposed in side by side relationship with said pair of insulated conductors and having first and second remote extremities respectively connected electrically and mechanically to one and the other of said pair of insulated conductors, said lamps having a spacing along the pair of insulated conductors sufficiently great that the electric leads of each lamp is spaced along such electric conductors from the electric leads of the lamps adjacent thereto, the arrangement being such that the lamps are connected in electrical parallel between the conductors and such that the electric leads need not be electrically insulated to avoid any electrical shorting path between the conductors, an elongated tubular member having a light transmitting characteristic, said insulated conductors and all of said lamps being disposed within and extending along the length of the hollow interior of the tubular member with said insulated conductors having an end portion that extends outwardly from the tubular member at a position of egress therefrom, and

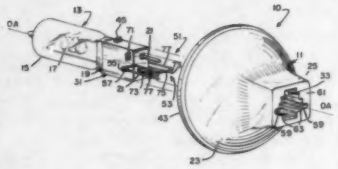
sealing means within the tubular member and adjacent the ends of the latter for preventing fluid communication between the exterior of the tubular member and the lamps within the tubular member, said tubular member having a lateral opening adjacent one end thereof at said position of egress, with said end portion of the insulated conductors extending through said lateral opening, and with said sealing means also sealing said lateral opening against fluid communication therethrough.

4,376,967

FRONT LOADING PROJECTION UNIT WITH WIREFORM RETENTION MEMBER

Harold L. Hough, Beverly, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 3, 1980, Ser. No. 212,398
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—306 **9 Claims**



1. In a projection unit including a glass reflector having a front concave reflecting portion and a rear neck portion with an opening therein, an incandescent lamp including an envelope portion and a sealed end adjacent said envelope portion, a first retention member secured to said sealed end of said lamp for retaining said lamp therein and aligning said lamp within said reflector whereby said envelope portion will be positioned substantially within said front concave reflecting portion and said sealed end will be positioned substantially within said opening within said rear neck portion, said first retention member removably positioned within said opening and adapted for being removed through said front concave reflecting portion of said reflector, and a second retention member for retaining said first retention member within said opening of said reflector and permitting removal thereof through said front concave reflecting portion, the improvement wherein said second retention member comprises:

a resilient member pivotally positioned on said first retention member for engaging said rear neck portion of said reflector to effect said retention of said first retention member within said opening of said reflector and for being secured in said position of engagement with said rear neck portion.

4,376,968

PROTECTION SYSTEM FOR IMMUNIZING AN INVERTER SYSTEM AGAINST A-C LINE VOLTAGE DISTURBANCES

Russel P. Wueschinski, Dover, Pa., and Edward C. Siemon, Newfield, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

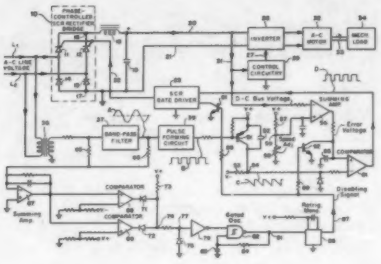
Filed Feb. 13, 1981, Ser. No. 234,142
Int. Cl.³ H02H *1/06, 7/122*
U.S. Cl. 363—37 **6 Claims**

1. A controlled d-c power supply for rectifying applied a-c power line voltage to develop therefrom a d-c bus voltage of a desired magnitude for application to an inverter, the a-c line voltage being subject to unwanted disturbances caused by momentary power outages or major power reductions, comprising:

a phase-controlled SCR rectifier bridge, having at least two SCR's, for rectifying the a-c line voltage to produce d-c bus voltage of a magnitude determined by the conduction angle of the SCR's during each half cycle of the a-c power line voltage;

pulse generating means, responsive to a reduced amplitude replica of the a-c line voltage, for developing a ramp-shaped pulse during each half cycle of the a-c line voltage and including a band-pass filter for attenuating, in the reduced-amplitude replica of the a-c line voltage, frequencies above and below the voltage's fundamental frequency;

control means for utilizing the ramp-shaped pulses to trigger said SCR's into conduction at a desired phase angle, following the beginning of each half cycle of the a-c line voltage, thereby to control the conduction angle in order to establish the d-c bus voltage at a selected desired amplitude level;



sensing means which compares the input and output signals of said band-pass filter in order to detect the unwanted disturbances in said a-c line voltage caused by momentary power outages or major power reductions;

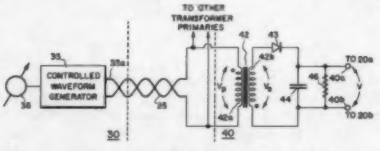
and disabling means, controlled by said sensing means, for turning said SCR's off during the occurrence of each unwanted disturbance, thereby rendering the d-c power supply immune to such disturbances.

4,376,969

CONTROL SIGNAL AND ISOLATION CIRCUITS

James F. Bedard; Scott E. Cutler; Charles W. Eichelberger, all of Schenectady, and Salvatore F. Nati, Jr., Syracuse, all of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,783
Int. Cl.³ H02P *13/16*
U.S. Cl. 363—78 **11 Claims**



1. In a system for controlling the excitation of an electrical load over a range of intensity levels wherein a controlled generating means adapted to be located remotely from the electrical load establishes the level of load energization, comprising:

(a) said controlled generating means comprising means for generating a pulse width modulated waveform having a variable duty cycle and load setting means for setting the duty cycle as a function of the desired level of load excitation;

(b) load control means, d-c isolation means and detection means all adapted to be positioned remotely from said controlled generating means;

(c) said d-c isolation means comprising input means for

electrical connection to said controlled waveform generator and output means capable of providing a pulse width modulated waveform responsive to the waveform from said controlled generating means;

(d) said detection means being connected in circuit between the output means of said d-c isolation means and the load control means to provide to said load control means an analog input signal of magnitude representative of the duty cycle of said pulse width modulated waveform;

(e) said controlled generating means being adapted to generate the pulse width modulated waveform having a desired duty cycle independent of any feedback from the output of said d-c isolation means;

(f) said load control means being constructed to vary the excitation of an electrical load over a range of intensity levels and to establish the level of excitation as a function of the duty cycle of the pulse width modulated signal generated by said controlled generating means.

4,376,970

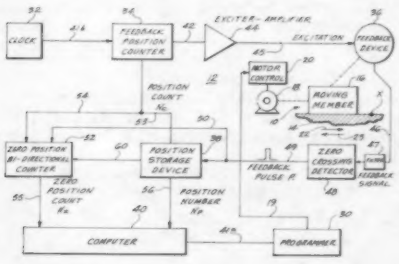
HIGH SPEED DIGITAL POSITION MONITORING SYSTEM

Kenneth A. Ilseman, and Richard W. Caddell, both of Brookfield, Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 22, 1980, Ser. No. 218,488

Int. Cl.³ G05B *19/19*; G06F *15/46*

U.S. Cl. 364—167 **12 Claims**



1. An electronic control system for monitoring the position of a moving member which is movable in opposite directions comprising:

first means operatively coupled to said moving member for generating first signal information which varies in response to movement of said moving member, said first signal information being ambiguous as to the direction of movement of said moving member when said moving member is moving at speeds greater than a predetermined speed;

second means operatively connected to said first means for generating second signal information indicative of which of the opposite directions of movement said movable member is moving in when said moving member is moving at speeds greater than said predetermined speed; and

third means operatively connected to said first and second means for processing said first and second signal information to determine the position of said moving member without ambiguity and generating third signal information indicative of the position of said moving member which is usable for control purposes.

4,376,971

SYSTEM FOR PROTECTION AGAINST GETTING CAUGHT IN AUTOMATICALLY OPERABLE DOORS OR WINDOWS, PARTICULARLY OF VEHICLES

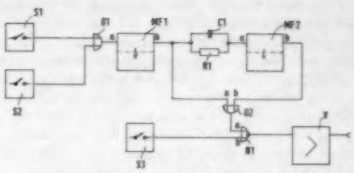
Hans Landgraf, Obermöllrich; Joachim Dörner, Kassel; Siegfried Heinrich, Edermunde, and Manfred Horn, Kaufungen, all of Fed. Rep. of Germany, assignors to Gebr. Bode & Co., Kassel, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 228,835

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003877

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—184 **8 Claims**



1. In an automatically operable closure, the improvement comprising an anti-catching system for protection against getting caught during the closing of the closure, the system comprising:

means responsive to the movement of the closure for generating an electric position signal whenever predetermined closure positions are reached and including means for generating an extreme-position signal to indicate when an extreme position of the closure has been reached;

at least one electric digital storage element set by at least one of the successive position signals and reset automatically after a preset time interval thereby changing the logic state of the output thereof;

logic circuit means receptive of the output of the at least one storage element and the extreme-position signal for producing a control signal when the output signal of the at least one storage element has an output value corresponding to the reset state and the extreme-position signal has a value corresponding to the closure being in an intermediate position; and

means responsive to the control signal for at least one of stopping and reversing the motion of the closure.

4,376,972

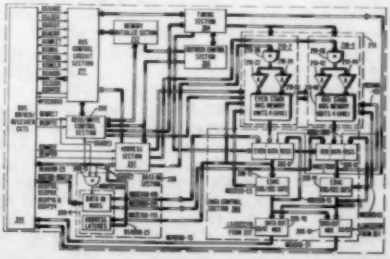
SEQUENTIAL WORD ALIGNED ADDRESS APPARATUS

Robert B. Johnson, Billerica; Chester M. Nibby, Jr., Peabody, and Dana W. Moore, Dover, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 8, 1980, Ser. No. 110,521

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **41 Claims**



1. A memory subsystem for use in a system including a processing unit coupled to a multiword bus in common with said subsystem for transfer of information therebetween during

bus transfer cycles of operation, said unit being operative to generate memory requests on said bus to said subsystem, each of said requests include a multibit address containing row and column addresses, said memory subsystem comprising:

a plurality of independently addressable memory module units, each memory unit being individually coupled to said multiword bus and having a set of input address lines, said each memory unit including a plurality of rows of random access memory chips and said random access memory chips including a predetermined number of addressable arrays of memory storage devices, said arrays being divided into a predetermined number of rows and columns;

address register means for storing a plurality of least significant address bits of each said address;

first and second multibit tri-state register means coupled to said bus for storing row and column addresses respectively of each said memory request address and said first and second register means being connected in common with said set of lines of said memory module units;

increment circuit means being connected in series with the least significant address lines of said set of address lines of a predetermined one of said memory module units; and

logic circuit means coupled to said address register means and to said increment circuit means; said logic circuit means being operative to condition said increment circuit means to modify the portion of said row address applied to said least significant address lines only as a function of the coding of said plurality of least significant address bits enabling simultaneous access to a plurality of sequential storage locations within said predetermined number of said addressable arrays of said memory module units during a single bus cycle of operation.

4,376,973

DIGITAL DATA PROCESSING APPARATUS

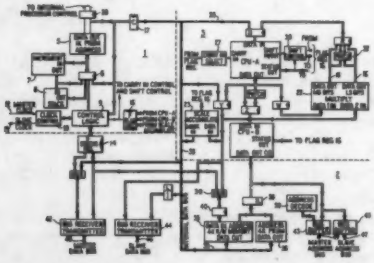
Howard R. Chivers, Highnam, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 8, 1980, Ser. No. 119,726

Claims priority, application United Kingdom, Feb. 13, 1979, 7905022

Int. Cl.³ G06F *9/22, 9/28*

U.S. Cl. 364—200 **10 Claims**



1. A data processing unit comprising:

a control section responsive to a control instruction to switch the processing unit from an idle mode to an execution mode, the control section being operative during the execution mode to initiate and control the sequence of execution of a program stored therein and to automatically switch the processing unit to the idle mode in which the control section is no longer operative to initiate and control the sequence of execution of a program stored therein,

a memory section including an area of read/write memory,

a computation section for performing calculations in accordance with instructions from the program and capable of accessing the read/write memory area during execution of the program,

interface means having access to the area of read/write memory through which the processing unit is able to access an external memory when in its execution mode, through which at least part of the read/write memory area of the processing unit is able to be accessed from outside when in its idle mode and through which said control instruction for switching the processing unit from its idle to its execution mode is able to be received from outside;

a predetermined part of the read/write memory area of the memory section which is accessible from outside via the interface means being adapted to receive said control instruction, and the control section including means for responding to the control instruction in the predetermined part of the read/write memory area,

the interface means comprising a master interface means including a master address bus through which the processing unit is able to receive address words designating locations in its read/write memory and a master data bus through which the processing unit is able to receive or transmit data to be written into or read from the memory locations designated by said address words, through which a predetermined part of the externally accessible read/write memory area is able to be accessed from outside for control and monitor purposes when the processing unit is in both its idle and execution modes, and through which the remaining part of the externally accessible read/write memory area is able to be accessed from outside only when the processing unit is in its idle mode,

and slave interface means including a slave address bus through which the processing unit is able to transmit memory addresses to an external memory area and a slave data bus through which data to be written into or read from the external memory is able to be transmitted or received, through which the processing unit is connectable to access the external memory area only when in its execution mode.

4,376,974

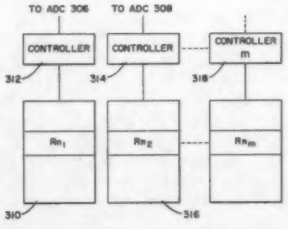
ASSOCIATIVE MEMORY SYSTEM

John W. Stewart; Darrell W. Woelk, and Marvin R. DeForest, all of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 31, 1980, Ser. No. 135,792

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **31 Claims**



1. An associative memory system, comprising:

storing means having at least first and second units for storing data therein, wherein a first predetermined number of bytes of data are obtained serially from said first unit followed by a second predetermined number of bytes of data obtained serially from said second unit to provide a stream of bytes of data;

first means and second means for simultaneously receiving at least a portion of said stream of said bytes of data as they are read serially from said storing means;

said first means also including a loop buffer for receiving and storing serially at least a portion of said stream of bytes of data from said storing means;

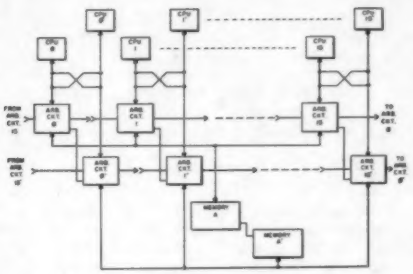
said second means also having means for performing at least one operation on at least a portion of said stream of said bytes of data as they are obtained serially from said storing means; and

said first means also having means for writing bytes of data from said loop buffer into said storing means simultaneously as said bytes of data are read therefrom whereby a write address for writing a said byte of data into said storing means is obtained by subtracting a third predetermined number from a current address of a byte of data being read from said storing means.

4,376,975
ARBITRATION CONTROLLER PROVIDING FOR ACCESS OF A COMMON RESOURCE BY A PLURALITY OF CENTRAL PROCESSING UNITS

Joseph A. Comfort; Thomas J. Perry, and Michel Loos, all of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 26, 1980, Ser. No. 163,049
The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.
Int. Cl.³ G06F *13/00, 15/16*
U.S. Cl. 364—200 7 Claims



1. An arbitration controller providing for equal priority sharing of a common resource by a plurality of CPUs, said arbitration controller comprising:

means for initialization providing a first signal;

a plurality of arbitration circuits including a first, at least one successive and a last arbitration circuit;

said means for initialization connected to at least one of said arbitration circuits;

a plurality of CPU buses, each connected between a particular CPU and a particular arbitration circuit on a one for one basis, each CPU bus including a control portion and an address/data portion;

a common bus connected between each of said CPUs and said resource via said particular arbitration circuit for the transmission of information between said resource and any of said plurality of CPUs via said address/data portion of said CPU bus;

bus means for connecting said common bus to each of said plurality of CPU buses in a tri-state fashion;

a plurality of circuit connections including a circuit connection between each arbitration circuit and each successive arbitration circuit, said last arbitration circuit connected to said first arbitration circuit, thereby forming a completed ring connection for propagating said first signal from one arbitration circuit to another arbitration circuit in a circular fashion;

each arbitration circuit connected to said control portion of said particular CPU bus and operated in response to said first signal and to a common bus request signal from its corresponding CPU to produce a second signal for allowing said corresponding one of said plurality of CPUs access to said resource via said common bus;

each said arbitration circuit including:

first gating means operated to propagate said first signal along said ring connection at a relatively high rate of speed;

latching means operated in response to said common bus request signal of said corresponding CPU to produce said second signal for allowing said CPU to access said resource via said common and CPU buses;

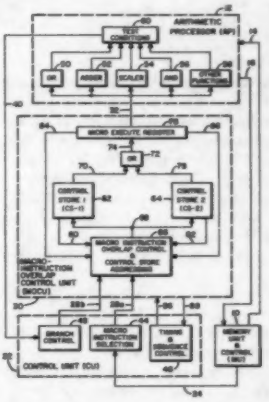
second gating means operated in response to said operated latching means and in response to said propagated first signal to propagate a third signal from each arbitration circuit to each successive arbitration circuit; and said first signal propagating through each of

said arbitration circuits in said ring connection to successively enable said CPU access to said resource via said common bus, while said third signal permitting said successive arbitration circuits to establish priority for subsequent access of said resource simultaneously with a present access of said resource.

4,376,976
OVERLAPPED MACRO INSTRUCTION CONTROL SYSTEM

Archie E. Lahti, Fridley; Kenneth L. Engelbrecht, Blaine, and Donald R. Kalvestrand, White Bear Lake, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,035
Int. Cl.³ G06F *9/38*
U.S. Cl. 364—200 33 Claims



1. In a digital data processing system having an instruction repertoire including a plurality of macro instructions which can be programmed and executed in desired sequences, and each macro instruction execution is under the control of one or more pre-stored micro instructions, each of said pre-stored micro instructions for controlling a predetermined portion of the execution of the macro instruction, macro instruction overlap control apparatus comprising:

first and second control store means, each adapted for storing the sequences of micro instructions for controlling the execution of the repertoire of macro instructions;

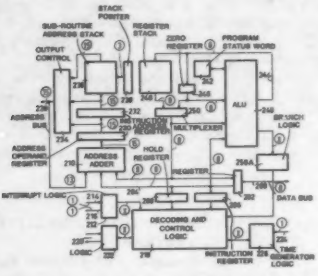
macro instruction execution overlap control means coupled to said first and second control store means for controlling the overlap of execution of sequentially received macro instructions; and

micro instruction execute means coupled to said first and second control store means and said macro instruction execution overlap control means for combining micro code instructions for simultaneous execution to effect overlap of execution of associated macro instructions.

4,376,977
COMPUTER SYSTEM WITH SCANNABLE PROGRAM MEMORY

Berend T. J. Bruinshorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1980, Ser. No. 178,646
Claims priority, application Netherlands, Aug. 27, 1979, 7906416
Int. Cl.³ G06F 9/00
U.S. Cl. 364—200 **8 Claims**

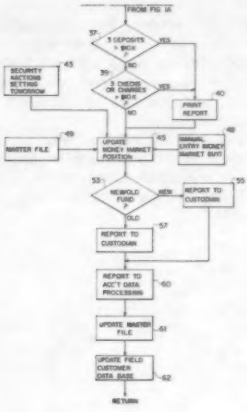


1. A computer system comprising as subsystems:
a. a program memory having a sequence of address locations for storing respective machine code data;
b. a keyboard;
c. a display device for displaying at least one row of alphanumeric characters;
d. a processor:
and interconnecting means for interconnecting said subsystems;
wherein said processor contains at least:
an address register having an increment input for addressing the program memory;
an instruction register having op code storage means (**205**) and further storage means (**207, 256**) for together storing an instruction of at most a predetermined length, said instruction register having an instruction input for coupling to an instruction output of said program memory;
first and second instruction decoder means connected to instruction outputs of said opcode storage means and said further storage means, respectively;
an execution element having a control input connected to a control output of said first instruction decoder for executing a data processing operation;
an address distance detector for detecting a predetermined address distance as traversed in said program memory, the maximum range of said address distance being longer than corresponds to an address distance covered in completely filling said instruction register, said address distance detector having an activation input connected to an activation output of said first instruction decoder for receiving an activation signal under control of a first opcode subset (110001xx) detected, and for thereupon receiving via first means (**209**) from the instruction register a first address distance to be covered in the program memory and then generating a first control signal (**296**);
wherein said address distance detector has second means (**298**) for monitoring a relative address distance as covered in the program memory after reception of said activation signal and upon reaching said first address distance generating a deactivation signal (**304**) and terminating said first control signal;
and wherein said processor is responsive to said first control signal for being driven into a non-active mode for information received from the program memory thereof until generation of said deactivation signal.

4,376,978
SECURITIES BROKERAGE-CASH MANAGEMENT SYSTEM

Thomas E. Musmanno, Brooklyn, N.Y., assignor to Merrill Lynch Pierce, Fenner & Smith, New York, N.Y.

Division of Ser. No. 173,331, Jul. 29, 1980, Pat. No. 4,346,442.
This application Oct. 22, 1980, Ser. No. 199,408
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ G06F 15/21
U.S. Cl. 364—408 **6 Claims**



1. In combination in a system for processing and supervising a plurality of composite subscriber accounts each comprising a margin brokerage account, subscriber implemented funds withdrawal means administered by institution means, and participation in at least one short term investment, manual entry means being employed for entering short term investment orders, brokerage account data file magnetic storage means for storing current information characterizing each subscriber margin brokerage account, means for receiving and verifying subscriber funds withdrawal transactions from said institution means and short term investment orders from said manual entry means, generating an updated credit limit for each account operating upon said brokerage account data file and said received and verified information, said updated credit limits for said plural subscriber accounts being communicated to said first institution, means for selectively generating short term investment transactions as required to generate and invest proceeds from said subscriber's accounts, said system further including plural such short term investments, and means for allocating said short term investment transactions to at least a predetermined one of said plural short term investments.

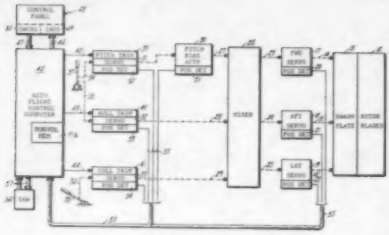
4,376,979
UPDATED LOCK-POSITIONING OF FOLDABLE HELICOPTER BLADES

Donald W. Fowler, West Haven, and Kenneth C. Arifian, Monroe, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 10, 1980, Ser. No. 195,723
Int. Cl.³ G06F 15/20; B64C 27/50
U.S. Cl. 364—424 **4 Claims**

1. A helicopter having foldable main rotor blades, the pitch angles of which are positionable by push rods in dependence upon the vertical position and tilt of a swash plate cooperating

with said push rods, said blades being lockable at specific pitch angles as a prerequisite to folding, said swash plate being positioned by a plurality of servos, each of said servos being separately operable in response to corresponding outputs of a mixer, the mixer in turn receiving inputs from pitch, roll and collective channels, each of said channels including an electrically operable trim actuator for providing a corresponding input to said mixer in response to a related trim command signal, a position detector for each of said servos, each position detector providing a servo position signal indicative of the position of a corresponding one of said servos, and signal processing means for storing a plurality of desired position signals indicative of corresponding predetermined servo posi-



tions at which rotor blade pitch angle would be correct for locking, for providing pitch, roll and collective reference signals indicative of corresponding trim commands to be applied to said pitch, roll and trim actuators, and for providing trim command signals to said pitch, roll and collective trim actuators in respective response to said pitch, roll and collective reference signals, characterized by:

said signal processing means comprising means for providing said reference signals by generating, in response to all of said desired position signals, reference signals corresponding to trim command signals which will cause said trim actuators to provide inputs to said mixer to cause said servos to be driven substantially to said predetermined positions as indicated by said servo position signals.

4,376,980

VARIOMETER

Jean L. Sicre, Fontenay aux Roses, France, assignor to S.F.E.N.A., Velizy Villacoublay, France

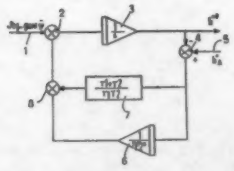
PCT No. PCT/FR79/00043, § 371 Date Jan. 15, 1980, § 102(e) Date Jan. 15, 1980, PCT Pub. No. WO79/01079, PCT Pub. Date Dec. 13, 1979

PCT Filed May 14, 1979, Ser. No. 185,917

Claims priority, application France, May 17, 1978, 77 14294

Int. Cl.³ G01P *3/62*; G06G *7/78*; G08B *21/00*

U.S. Cl. 364—565 **3 Claims**



1. An improved variometer comprising,

a. a dial entailing in a conventional manner a graduation representative of a vertical speed, a needle indicating on the said graduation, the instantaneous vertical speed $h\dot{x}^{\circ}$, an indicator representative of the potential vertical speed $h^{\circ}\gamma$, a display of the gradient of the aircraft, characterized in that the instantaneous vertical speed $h\dot{x}^{\circ}$ is obtained by means of a circuit solving the equation:

$$h\dot{x}^{\circ} = \frac{h^{\circ}_{A}}{1+\tau_1 s} \times \frac{1+(\tau_1+\tau_2)s}{1+\tau_2 s} + \frac{\tau_1}{1+\tau_2 s}(j_{z1} - g\cos\phi)$$

a formula in which:

j_{z1} is the component of the acceleration on the vertical axis of the aircraft;

g is the acceleration of gravity;

ϕ is the angle of roll of the plane;

s is the Laplace operator;

τ_1 and τ_2 are constants of time;

h°_{A} is a signal of the vertical speed derived from a unit for producing same; and

b. said circuit making it possible to obtain the instantaneous vertical speed $h\dot{x}^{\circ}$ comprising;

a first circuit comprising a first adder whose output is connected to a first integrator and receives a signal representative of the expression $(j_{z1} - g\cos\phi)$ as its input, the output of said first integrator provides a signal $h\dot{x}^{\circ}$;

a counter-feed-back loop comprising a subtractor receiving the signal $h\dot{x}^{\circ}$ and a signal h°_{A} as its inputs and whose output is connected, to a second integrator of transfer function $1/(\tau_1 \times \tau_2 s)$ and to an amplifier of gain $(\tau_1+\tau_2)/(\tau_1 \times \tau_2)$; said second integrator and amplifier being arranged in parallel and their output connected to the two inputs of a second adder whose output is connected to the second input of said first adder.

4,376,981

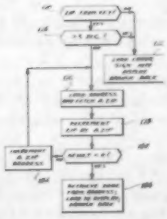
ELECTRONIC POSTAGE METERING SYSTEM

Frank T. Check, Jr., Orange; Alton B. Eckert, Jr., Norwalk, and Joseph R. Warren, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 918,784, Jun. 26, 1978, Pat. No. 4,180,856, which is a continuation of Ser. No. 820,058, Jul. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,914, Aug. 19, 1976, abandoned. This application Jul. 3, 1979, Ser. No. 54,955

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—570 **6 Claims**



1. A method for converting a postal zip code to a postal zone, of a given destination, comprising the steps of;

(a) storing a sequence of delta zip numbers, wherein a delta zip number is an absolute number corresponding to the number of postal zip numbers in a sequential group corresponding to a common destination zone;

(b) storing a sequence of postal zones corresponding to the sequence of storage delta zip numbers;

(c) sequentially decrementing said postal zip number to be converted by absolute numbers in accordance with said stored sequence of delta zip numbers, until a determined numerical value occurs; and

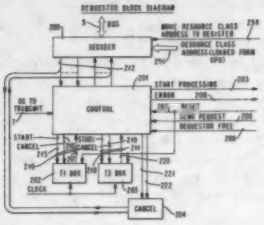
(d) then retrieving the corresponding zone in said sequence of postal zones.

4,376,982

PROTOCOL FOR INTER-PROCESSOR DIALOG OVER A COMMUNICATION NETWORK

David F. Bantz, Chappaqua, N.Y.; Michel F. Choquet, Saint Donat, France, and Jack L. Rosenfeld, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,422
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—900 6 Claims



1. In a communication system including one or more requestors and one or more responders each representing a resource useable by the requestors, apparatus for establishing a message transmitting connection between a requestor and a responder in accordance with a protocol of signal transmissions between the requestors and responders, including, in combination:

signal conveying means for transmitting signals in accordance with the protocol;

a requestor protocol interface connecting said signal conveying means to each requestor;

a responder protocol interface connecting said signal conveying means to each resource;

said requestor protocol interface including;

means for transmitting a request for resource use signal;

means for receiving and storing responder acceptance signals;

means responsive to said means for receiving responder acceptance signals, for transmitting a confirmation signal to a responder, and for transmitting a request cancellation signal;

said responder protocol interface including;

means for receiving and storing a request for resource use signal;

conditional means, responsive to said means for receiving a request signal, for transmitting an acceptance signal;

means for indicating the associated resource is committed for use by a requestor;

means for receiving a confirmation signal;

means for receiving a request cancellation signal; and

means, connecting said means for indicating, and said means for receiving a request cancellation signal, to said conditional means, for controlling the ability of the responder to transmit an acceptance signal.

4,376,983

HIGH DENSITY DYNAMIC MEMORY CELL

Shyh-Chang Tsaur, Stafford, and Chang-Kiang Kuo, Austin, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

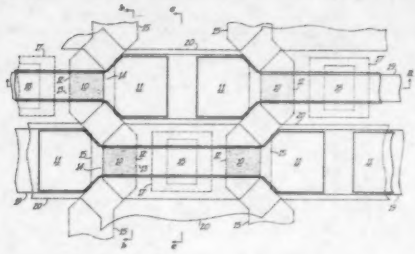
Filed Mar. 21, 1980, Ser. No. 133,376
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—53 15 Claims

12. A semiconductor memory device including an array of rows and columns of one-transistor dynamic memory cells in a face of a semiconductor body, each cell having a capacitor and having an access transistor of the insulated gate field-effect type with a source-to-drain path and a gate, the memory device comprising:

a plurality of semiconductor regions in said face of the semiconductor body, said regions being laterally spaced from one another along said face with thick field oxide in said face between the regions, each region providing one end of the source-to-drain path of the two access transistors for two adjacent cells in a column,

a plurality of electrodes at said face adjacent said regions, each electrode providing the gate of an access transistor,

a plurality of connector areas at said face arranged in columns, each of the areas being for the purpose of making



electrical connection separately to one of said regions to thereby provide a connection to two adjacent cells,

conductive means extending laterally along said face insulated from said electrodes, the conductive means providing an upper plate for all of the capacitors of all of the cells and overlying a capacitor area for each individual cell, the capacitor areas in each of said pairs of adjacent cells having separated on said face from other pairs but not from one another by said thick field oxide, and

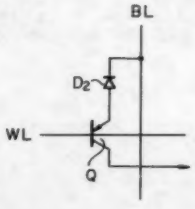
a plurality of parallel strips of conductive material extending along said face but insulated therefrom, each of the strips making electrical connection to a plurality of said connector areas and thereby providing column lines.

4,376,984

PROGRAMMABLE READ-ONLY MEMORY DEVICE

Toshitaka Fukushima, Yokohama; Kazumi Koyama, Kanagawa, and Kouji Ueno, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 7, 1980, Ser. No. 137,959
Claims priority, application Japan, Apr. 13, 1979, 54-45135
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—104 30 Claims



10. A PROM cell of the type having first and second junctions opposed in series, information being permanently stored in said PROM cell by selectively short circuiting said first junction, said PROM cell comprising:

a substrate, comprising a semiconductor material of a first conductivity type;

a epitaxial layer atop said substrate, comprising a semiconductor material of a second conductivity type;

a first region in said epitaxial layer and spaced from said

substrate, said first region comprising a semiconductor material of said first conductivity type and forming a first pn junction with said second conductivity type semiconductor material of said epitaxial layer;

a second region in and spaced from said first pn junction, said second region comprising a semiconductor material of said second conductivity type and forming a second pn junction with said first conductivity type semiconductor material of said first region;

a buffer layer atop said second region; and

a metallic contact atop said buffer layer;

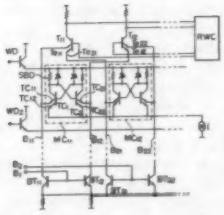
said buffer layer preventing a metal-type semiconductor eutectic, formed of the metallic material of said metallic contact and the semiconductor material of said second region and which grows in the absence of said buffer layer during normal heating processes, from entering deeply into said epitaxial layer and towards said second pn junction.

4,376,985

SEMICONDUCTOR MEMORY DEVICE

Hideaki Isogai, Higashikurume, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1980, Ser. No. 179,899
Claims priority, application Japan, Aug. 23, 1979, 54/107393
Int. Cl.³ G11C *11/40, 13/00*
U.S. Cl. 365—155 **10 Claims**



1. A semiconductor memory device comprising:

an isolation region having a plurality of portions;

memory cells, each comprising a pair of multi-emitter transistors each having a collector and a base which are cross-connected to each other and each being surrounded by one of the plurality of portions of said isolation region, said memory cells arranged in row and column directions; and

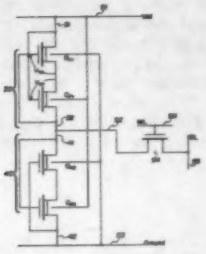
read-out transistors, each having a base and an emitter which is commonly connected to one of the emitters of said multi-emitter transistors, arranged in each column, each of said read-out transistors being surrounded by one of the plurality of portions of said isolation region, each of said pair of multi-emitter transistors formed such that the relative position of said one of the emitters of said multi-emitter transistor, which is commonly connected to the emitter of one of said read-out transistors, to its base and the isolation region is the same as the relative position of said emitter, of said one of said read-out transistors, to its base and the isolation region, so that the characteristics of both the multi-emitter transistors and the read-out transistors have the same variation.

4,376,986

DOUBLE LAMBDA DIODE MEMORY CELL

Mohamed I. Elmasry, Waterloo, Canada, and LaVerne R. Peterson, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 30, 1981, Ser. No. 307,158
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—159 **9 Claims**



1. An improved memory cell comprised of:

first and second conductive means for carrying respective bias voltages in said cell;

a third conductive means for carrying an input/output voltage signal in said cell;

a Lambda diode coupled between said first and third conductive means for there providing a negative dynamic resistance whenever said input/output voltage signal is within a predetermined range between said bias voltages on said first and second conductive means;

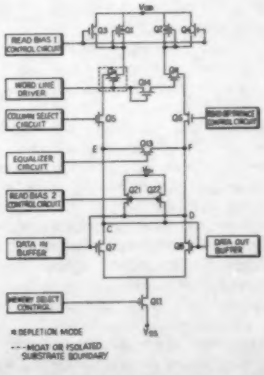
wherein the improvement comprises a voltage dependent resistance means coupled between said second and third conductive means for there providing a negative dynamic resistance in response to at least some of said input/output voltages within said range.

4,376,987

THRESHOLD REFERENCED MNOS SENSE AMPLIFIER

Yukun Hsia, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 18, 1980, Ser. No. 178,834
Int. Cl.³ G11C *7/00, 11/40*
U.S. Cl. 365—184 **24 Claims**



1. In a transistor memory array disposed in bit line columns and word line rows comprising metal nitride oxide semiconductor field effect transistors (MNOS) wherein the organiza-

tion of the array is such that the array comprises means for single-element-per-bit storage and two-element-per-bit sensing wherein the sensing means compares a threshold voltage of a single MNOS contained within an MNOS bit line column of the memory array to the threshold voltage of a single reference transistor contained within a column of such reference transistors wherein the MNOS column and the reference transistor column are substantially in electrical balance during the operation of the sensing means, wherein each MNOS bit line column is connected to the sensing means by a separate decoding means wherein the decoding means effectively isolates the column from the remainder of the array and where that portion of the array underlaying the MNOS transistors is underlain by an isolation tub connected to a control circuit,

a method of operating the array wherein the threshold voltage levels of all of the MNOS devices within the array are set to one threshold voltage level simultaneously.

4,376,988
METHOD AND CIRCUITRY ARRANGEMENT FOR REFRESHING DATA STORED IN A DYNAMIC MOS MEMORY

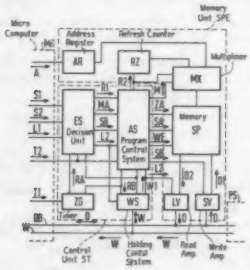
Volker Ludwig, Geretsried, and Juergen Heitmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,138

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009871

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—222 **9 Claims**



1. A method for refreshing data stored in a dynamic MOS memory, comprising the steps of:

providing a control means for reading or writing memory processes which read or write data in said MOS memory;

performing a distributed refreshing process by sequentially refreshing the memory line-by-line by successive refreshing processes, each line being refreshed prior to expiration of a shortened time duration which is shorter than a predetermined time duration related to a total time duration for refreshing the entire memory divided by the number of lines in the memory;

said shortened time duration corresponding to the predetermined time duration being shortened by a time duration of a reading or writing memory process for reading or writing in one line of the memory;

executing each refreshing process independently of the memory processes;

delaying execution of a reading memory process for one line during a refreshing process for the line and until its conclusion; and

delaying a refreshing process of a line until a reading or writing memory process for the line is concluded.

4,376,989
SEMICONDUCTOR DYNAMIC MEMORY

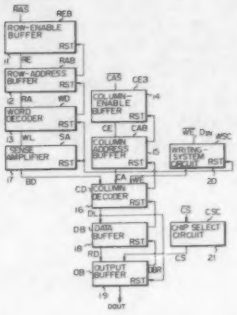
Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 25, 1981, Ser. No. 247,283

Claims priority, application Japan, Mar. 28, 1980, 55-39891

Int. Cl.³ G11C *8/00*

U.S. Cl. 365—230 **11 Claims**



1. A semiconductor dynamic memory comprising a plurality of interface circuits including:

a row-enable buffer for generating a row enable output signal;

a row address buffer, operatively connected to receive the row enable output signal from said row enable buffer;

a word decoder operatively connected to said row address buffer;

word lines operatively connected to said word decoder;

a group of sense amplifiers, operatively connected to said word lines, for generating a sense output signal;

a column enable buffer for generating a column enable output signal;

a column address buffer, operatively connected to receive the column enable output signal from said column enable buffer, for generating a column address signal in dependence upon the column enable output signal;

a column decoder operatively connected to receive the column address signal from said column address buffer and which column address signal selects one of said sense amplifiers;

a data buffer operatively connected to receive the sense output signal of the selected sense amplifier; and

an output buffer operatively connected to said data buffer, at least one of said interface circuits being reset, so as to be ready to execute the next processing, by a reset signal which is generated by a connected interface circuit which receives an output signal generated by the at least one interface circuit and the reset signal proves that said connected interface circuit has begun its operation.

4,376,990
DEVICE FOR TRANSIT TIME MEASUREMENT AND METHOD

Alexander Metchev, Vienna, Austria, assignor to "Eumig" Elektrizitäts- und Metallwaren-Industrie Gesellschaft m.b.H., Wiener Neudorf, Austria

Filed Aug. 28, 1980, Ser. No. 182,511

Claims priority, application Austria, Aug. 29, 1979, 5765/79

Int. Cl.³ G01S *15/08, 7/66*

U.S. Cl. 367—95 **23 Claims**

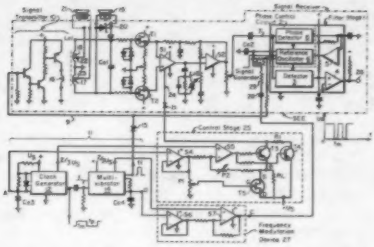
1. In a device for the transit time measurement of electric, electromagnetic and acoustic signals, particularly supersonic signals, of at least one predetermined frequency range, having a signal transmitter for the sending of measurement signals to an object and a signal receiver for receiving the measurement

signals reflected by the object of a substantially predetermined frequency and having a time measuring device for determining the transit time of the measurement signals between the device and the object, from which the distance of the object from the device can be derived, the improvement comprising

signal generator means (6) for both at least triggering the signal transmitter (10, L_{01}) and for controlling the signal receiver (1–8),

filter stage means (1) for tuning the signal receiver, said filter stage means being connected with said signal generator,

a signal transducer having terminals,



a transformer (L_{01}) has two symmetrical secondary windings (17, 18) which are connected in series with each other and which are connected via a center tap thereof with a reference potential and at other connections thereof at least indirectly to the terminals of said signal transducer,

at least one amplifier stage (10) is connected to said transformer and to an output of said signal generator means with the output signal of said signal generator means being adapted, via said at least one amplifier stage, to feed said transformer (L_{01}).

4,376,991

ELECTRONIC WATCH WITH ANALOGIC DISPLAY

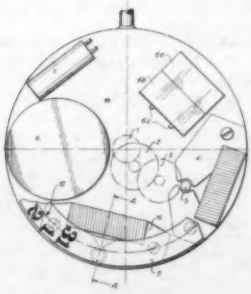
Valentin Piaget, La Cote-aux-Fees, Switzerland, assignor to Complications S.A., Neuchatel, Switzerland

Filed Jul. 28, 1981, Ser. No. 287,578

Claims priority, application Switzerland, Aug. 18, 1980, 6210/80

Int. Cl.³ G04B *19/24*

U.S. Cl. 368—37 **3 Claims**



1. In an electronic watch having an analogic hour and minute hand display and a date crown, comprising a first micro-motor controlled by a first control circuit driven by a time base and powered by a battery, and a gear train driven by said first micro-motor and driving the hands of the display of the watch; the improvement comprising a second micro-motor controlled by a second control circuit driven by said time base, said second micro-motor driving said date crown completely independently from the gear train driven by the first micro-motor.

4,376,992

ELECTRONIC WRISTWATCH WITH ALARM FUNCTION

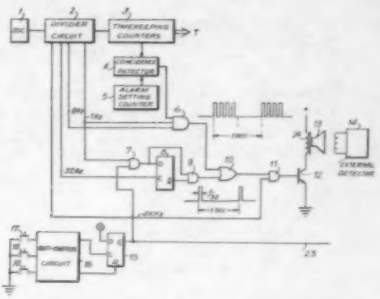
Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 27, 1980, Ser. No. 125,304

Claims priority, application Japan, Feb. 28, 1979, 54-23911

Int. Cl.³ G04C *11/02*; G04F *5/00*; G04C *21/16*

U.S. Cl. 368—47 **10 Claims**



1. In an electronic wristwatch including an oscillation circuit generating a time standard frequency signal, a divider network dividing down said standard frequency signal and outputting lower frequency signals, timekeeping circuits, display driving circuits, a display, the improvement therein comprising:

an alarm circuit including a sounding device for producing audible signals at a preselected time;

induction coil means, said coil means being a portion of said sounding device, said coil means cooperating with a power source, and being adapted to produce a magnetic field externally of said coil means when current flows therethrough, said magnetic field being detectable externally of said wristwatch;

switch means, the state of said switch means, on or off, controlling current flow through said coil means;

first circuit means for signal generating, said signals being derived from said divider network and applied to said switch means to control said current flow at a first repetition rate to generate a corresponding external magnetic field for timing said wristwatch by magnetic field detection;

an external member, operation of said external member activating said first circuit means for signal generation.

4,376,993

ELECTRONIC WATCH WITH SEQUENTIAL READOUT AND CONTROL

Alfred B. Freeman, 2044 W. 12th St., Emporia, Kans. 66801

Continuation of Ser. No. 854,524, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 731,629, Oct. 12, 1976, abandoned, which is a continuation of Ser. No. 478,690, Jun. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 397,589, Sep. 14, 1973, abandoned, which is a continuation of Ser. No. 246,910, Apr. 24, 1972, abandoned. This application Aug. 11, 1980, Ser. No. 177,230

Int. Cl.³ G04C *17/00*; G04B *23/02*; G04C *9/00*

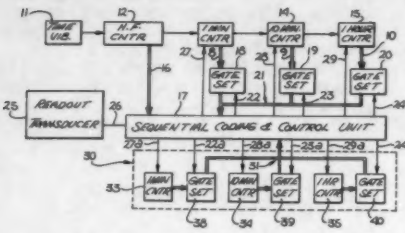
U.S. Cl. 368—69 **59 Claims**

1. In an electronic watch having a high frequency timing element and a high frequency counter driven by said timing element, the combination of:

(a) a time register driven by said counter for storing information representative of time;

(b) a sound transducer;

(c) means coupled to said sound transducer and to said time register for triggering a readout of the time stored in said register responsive to a tap on said sound transducer;



(d) means responsive to said triggering means for driving said transducer with signals representing the time stored in said time register; and

(e) means for coupling said driving means to said time register.

4,376,994

TIME DETECTING DEVICE FOR ALARM CLOCK

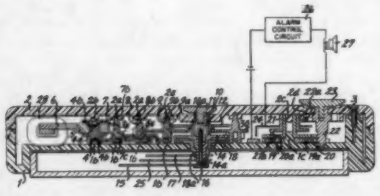
Masuo Ogihara; Nobuo Shinozaki; Tadashi Ishikawa, and Yoichi Seki, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 19, 1980, Ser. No. 218,184

Claims priority, application Japan, Jan. 17, 1980, 55-3943

Int. Cl.³ G04B *23/02*; G04C *21/16*

U.S. Cl. 368—74 **3 Claims**



1. A time detecting device comprising an hour gear wheel for indicating time, an alarm gear wheel for indicating an alarm time and a detecting device for actuating an alarm device by mechanically shifting when the phases of said hour gear wheel and said alarm gear wheel coincide, characterized by a detecting plate supported coaxially with said hour gear wheel and said alarm gear wheel and adapted to be shiftable in the axial direction, guiding parts formed on said hour gear wheel and said detecting plate respectively for pushing and turning said detecting plate as said hour gear wheel turns in the normal direction, a hole and a projection formed on said alarm gear wheel and said detecting plate respectively for detecting the time and a cam face or cam faces formed at least on either said hour gear wheel, said alarm gear wheel or said detecting plate for pushing up said detecting plate in the direction to release the engagement between said hole and said projection irrespective of direction of turning of said alarm gear wheel.

4,376,995

TIMEKEEPING DEVICE

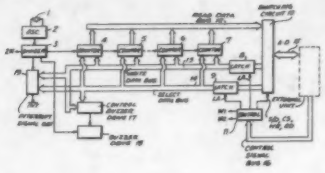
Eisaku Shimizu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,435

Claims priority, application Japan, May 8, 1979, 54-56020

Int. Cl.³ G04F *8/00*; G04C *15/00, 9/00*

U.S. Cl. 368—107 **20 Claims**



1. A timekeeping device comprising:

oscillator circuit means generating a high frequency standard signal;

a divider network dividing down said standard signal and outputting lower frequency signals;

a plurality of functions, said plurality of functions having data input signals and outputs, at least a portion of said functions having inputs derived from said divided down standard signals;

means for individually addressing said plurality of functions by an external unit, said means for addressing including a first data bus interconnecting at least a portion of said plurality of functions;

means for transmitting to said external unit said output signals from said functions, said means for transmitting including a second data bus interconnecting at least a portion of said plurality of functions;

switch means, said switch means being positioned intermediate said external unit and said plurality of functions and being adapted for selectively connecting said first data bus or said second data bus to said external unit, said external unit addressing and reading said functions without time restriction of access nor interruption of said functions,

said external unit operating at speeds unlimited by need for access to said function signals.

4,376,996

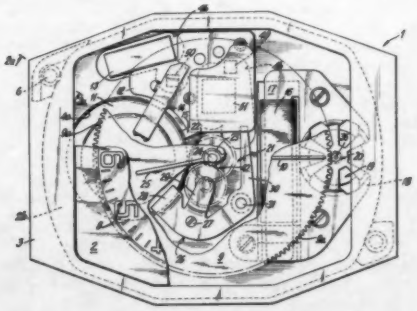
THIN STEPPING MOTOR WATCH

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 27, 1981, Ser. No. 258,061

Int. Cl.³ G04B *19/04*

U.S. Cl. 368—220 **13 Claims**



1. In a timepiece of the type having a crystal, a case with a

caseback, a stepping motor having a rotor pinion disposed in said case, and an electronic circuit operating said stepping motor to turn said rotor pinion, the improvement comprising:

a minute disc rotatably mounted in the case and driven directly at its periphery by said rotor pinion,

a fixed center post disposed in the caseback, a cannon pinion connected to said minute disc,

rotatable means extending through said disc and said cannon pinion, comprising a sleeve rotatably mounted on said center post and having an hour wheel connected to its lower end,

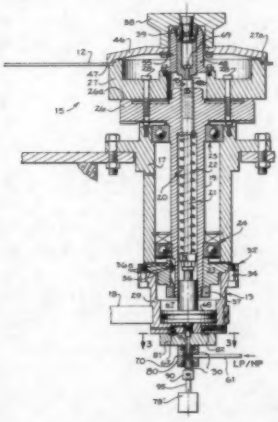
an hour hand mounted above said disc between the disk and the crystal on said rotatable means, and

an intermediate gear and pinion assembly disposed below said disc and adapted to be driven by the cannon pinion and to drive said hour wheel.

4,376,997
SPINDLE ASSEMBLY

Frederick S. Eggers, San Jose, Calif., assignor to Pro Quip, Inc., Santa Clara, Calif.

Filed Mar. 23, 1981, Ser. No. 246,678
Int. Cl.³ G01D *15/28*; G11B *17/02, 3/62*
U.S. Cl. 369—270 **10 Claims**

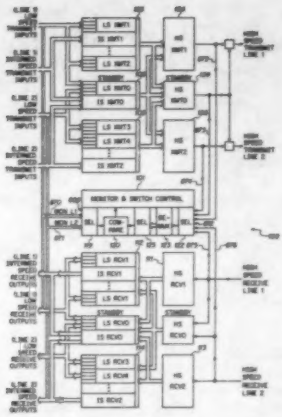


1. In a spindle assembly of a type adapted to receive and support a disc to rotate with the spindle assembly, said spindle assembly comprising means for clamping and releasing a disc to said spindle assembly for rotation with said spindle assembly when clamped thereto, operating means movable between extended and retracted positions for operating the last named means, the thickness of a disc so clamped serving to define the degree of retraction of said operating means, drive means for rotating said spindle assembly, a fluid operated control system for activating and deactivating said drive means, said control system including a control valve operated in response to the degree of retraction of said operating means and serving to inhibit said drive means to preclude rotation of said spindle assembly whenever the degree of retraction lacks correspondence to a predetermined standard.

4,376,998
MULDEM WITH MONITOR COMPARING MEANS WHICH ACCEPTS DIFFERENT DATA RATES

Ned E. Abbott, McKinney; Hampapur R. Keshavan, Dallas, and Robert J. McGuire, Richardson, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1980, Ser. No. 155,918
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—13 **58 Claims**



1. A multiplexer combining a plurality of parallel digital data paths carrying different data rates LS and IS, where IS is greater than LS, for serial transmission of data at a yet higher rate HS, comprising in combination:

a plurality of parallel data input groups for receiving LS and IS data rates;

transmission means for multiplexing LS and IS rate data from said groups for serial transmission of HS rate data on an output line; and

monitor means having a first input side connected to the input to said groups and a second input side connected to said output line for monitoring data path failures through said multiplexer by comparing its input and output, said monitor means comprising comparing means which automatically accepts said different data rates LS and IS on said first input side including

means for selecting the data received on one of said data paths at said input groups,

means depending on the rate of the selected data for adjusting the selected data to conform to said transmission means regarding bit formats included in said multiplexing, and

means for providing a clock B, with a rate dependent on the rate of the selected data, along with the adjusted selected data at said first input side.

4,376,999
MULDEM WITH MONITOR TESTING ON-LINE AND OFF-LINE PATHS

Ned E. Abbott, McKinney, Tex.; Hampapur R. Keshavan, Huntington Beach, Calif., and Robert J. McGuire, Richardson, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

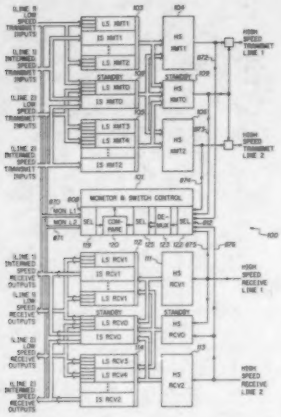
Filed Jun. 3, 1980, Ser. No. 155,981
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—16 **33 Claims**

1. A multiplexer with an improved monitoring system for the detection of malfunctions, comprising in combination:

a plurality of parallel data input groups;

normally on-line transmission means multiplexing said data input groups for serial transmission of high speed data;

standby data protective switching means providing an alternate standby data path configuration around said transmission means upon malfunction of the normally on-line data path configuration through said transmission means, and including auto-revert means automatically restoring said



data path to said normally on-line configuration upon correction of said malfunction; and

monitor means testing data paths through said multiplexer for detection of malfunctions in said multiplexer, and including a latched display of said malfunction after said automatic restoration from said standby configuration to said normally on-line configuration by said auto-revert means, to provide an indication of a corrected malfunction.

4,377,000

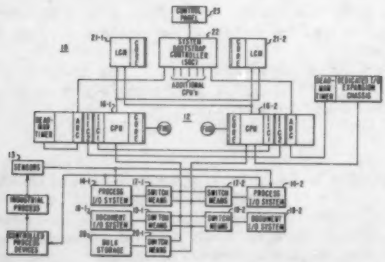
AUTOMATIC FAULT DETECTION AND RECOVERY SYSTEM WHICH PROVIDES STABILITY AND CONTINUITY OF OPERATION IN AN INDUSTRIAL MULTIPROCESSOR CONTROL

Carl J. Staab, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 146,933, May 5, 1980, abandoned. This application Jun. 18, 1980, Ser. No. 160,411

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—11 **5 Claims**



1. A multiprocessor computer control system comprising at least a first central processor and a second central processor, a plurality of sensors coupled to equipment in a production system, means for connecting said sensors to first and second process input/output systems, a plurality of controllable devices for operating the production system equipment, switch means including at least first switch means for coupling said first process input/output system to said first central processor and second switch means for coupling said second process input/output system to said second central processor, and means for detecting control system faults and providing control system recovery in reconfigured form as necessary with substantially no process disturbance, said fault detecting and recovery means including a system bootstrap microprocessor controller coupled to each said central processor, means forming a part of said microprocessor controller and said central processors for sensing any of a plurality of control system failures and for thereby triggering said microprocessor controller into a recovery mode of operation, means for stopping said central processors and placing process control signals in a hold state upon command by said microprocessor controller, means for detecting the integrity of each central processor, said central processors including means for defining reconfigured central processor hardware so that process control duties are loaded only on operational central processor hardware, means including said microprocessor controller for operating said switch means as required so that only operational central processor hardware is coupled to the process equipment, means for restarting said system after completion of control system reconfiguration if any, and means for returning said microprocessor controller to a monitor mode after completion of the fault detection and recovery mode.

4,377,001

METHOD FOR OPTICAL DETERMINATION OF SATURATION TEMPERATURE AND APPARATUS THEREFOR

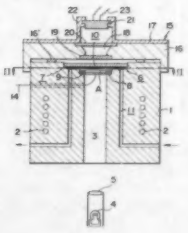
Reiji Takeda, and Shozo Oikawa, both of Obihiro, Japan, assignors to Nippon Tensaiseito Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,470

Claims priority, application Japan, Oct. 29, 1979, 54-148784[U]; Feb. 18, 1980, 55-17819

Int. Cl.³ G01N *25/12, 21/51*

U.S. Cl. 374—17 **6 Claims**



1. A method for the optical determination of the saturation temperature of a given substance in a solution subject to test by a procedure involving the steps of placing the solution in a test cell, suspending therein fine crystals of the solute dissolved in the solution thereby preparing a test specimen, mounting the test cell now containing the test specimen on a mounting base formed in a temperature-adjustable heater, gradually elevating the temperature of the test specimen and throwing a light upwardly at the test specimen, receiving the light penetrating through the test specimen on a photoelectric element and calculating the saturation temperature based on the temperature of the heat specimen and the amount of electricity generated in the photoelectric element, which method is characterized by causing the fine crystals of the solute to be deposited fast in the form of a thin layer on the light-penetrating surface of the test cell and then, pouring said solution on the deposited thin layer to prepare a test specimen, mounting the test cell containing the test specimen on said mounting base, gradually

elevating the temperature of the test specimen and throwing light upwardly at the test specimen, at that time an empty space on the cell is made as a closed empty space and a preheated air is passed through the closed empty space.

4,377,002

X-RAY DIAGNOSTIC GENERATOR COMPRISING AN INVERTER CIRCUIT FEEDING THE HIGH VOLTAGE TRANSFORMER

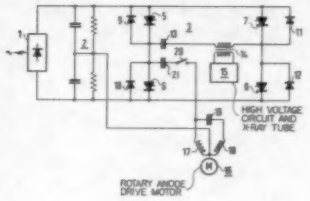
Hartmut Krause, Erlangen, and Gerd Seifert, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 288,938

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034286

Int. Cl.³ H05G *1/66*

U.S. Cl. 378—093 **1 Claim**



1. An x-ray diagnostic generator comprising a d.c. voltage source having a power rectifier, an inverter circuit fed by said d.c. voltage source, a high voltage transformer connected with said inverter and having an output, an x-ray tube connected to the output of the high voltage transformer, a rotary anode drive circuit including a rotary anode motor designed as an induction motor, in which the rotary anode motor is likewise fed by the inverter circuit, characterized in that the inverter circuit (3) comprises a full bridge arrangement with two pairs of alternately closable electronic switches (5 through 8), having a first diagonal including said high voltage transformer, and having a second diagonal connected with said d.c. voltage source (1, 2), a switch (20), said full bridge arrangement including first and second current flow paths each including one of said electronic switches and an intervening connection point, and means for connecting the rotary anode motor (16) via said switch (20) to said connection point of said first and second current flow paths to supply alternating current to said rotary anode motor while said first diagonal is deenergized, and means for energizing said first diagonal with alternating current to energize said high voltage transformer.

4,377,003

TESTING DEVICE FOR ELECTRONIC CIRCUITS AND ESPECIALLY FOR PORTABLE RADIOS

Hideaki Abe, and Koji Yamashita, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

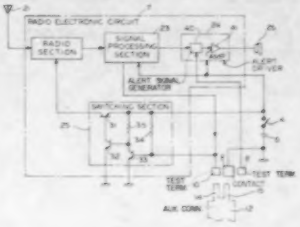
Filed Jun. 13, 1980, Ser. No. 159,154

Claims priority, application Japan, Jun. 19, 1979, 54-83831[U]

Int. Cl.³ H04B *1/034, 1/08*

U.S. Cl. 455—90 **6 Claims**

1. A portable communication device comprising a housing, a battery compartment defined in a portion of said housing to receive a battery, and an electronic circuit mounted in said housing, an auxiliary connector means for test use, said auxiliary connector means including a magnet and a connecting terminal, said battery compartment including a contact for making a connection to one electrode of said battery when it is mounted in said battery compartment and a test terminal means adjacent said contact and connected to said electronic circuit, said auxiliary connector means interconnecting said contact and said test terminal to place said electronic circuit in a condition for conducting a test operation when said auxiliary con-



nector means is mounted over said battery compartment responsive to the attraction of said magnet.

4,377,004

SETTING CIRCUIT

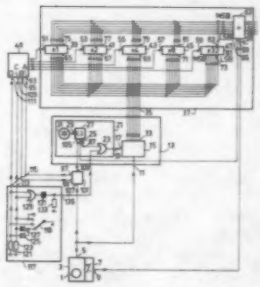
Derk J. C. Wassink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,881

Claims priority, application Netherlands, Aug. 16, 1979, 7906237

Int. Cl.³ H04B *1/26*; G04C *9/00*

U.S. Cl. 455—176 **4 Claims**



1. A setting circuit capable of obtaining a digital signal combination which represents a value that depends on the rotation of a setting shaft comprising:

a rotatable setting shaft,

a pulse generator coupled to said setting shaft,

means for measuring the speed of rotation of said shaft, said measuring means receiving pulses from said pulse generator upon the rotation of said shaft which when the speed of rotation of said shaft is increased or decreased causes an accelerated or decelerated change in the value represented by said digital combination,

a counting circuit which is coupled to said pulse generator for counting the pulses applied to said rotation measuring means, said counting circuit comprising a periodic resetting circuit,

means for establishing a multiplying factor, and

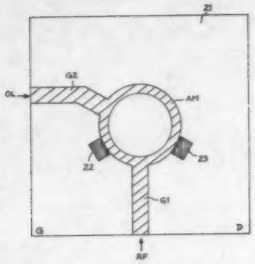
a combining circuit in which periodically occurring final pulse count states of said counting circuit are combined in order to obtain said digital combination with a multiplying factor from said multiplying means which is adjustable by said rotation measuring means.

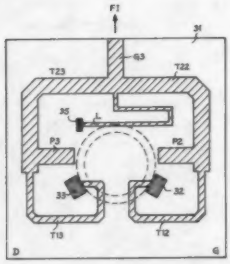
4,377,005

ULTRA-HIGH FREQUENCY HYBRID MIXER

Maurice Marchand, and Yan Haentjens, both of Boulogne Billancourt, France, assignors to LMT Radio Professionnelle, France

Filed Aug. 27, 1981, Ser. No. 297,043
Claims priority, application France, Sep. 9, 1980, 80 19414
Int. Cl.³ H04B 1/26
U.S. Cl. 455—327 7 Claims





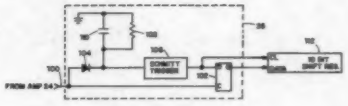
1. An ultra-high frequency hybrid mixer which comprises:
a first dielectric layer having first and second faces;
a second dielectric layer having third and fourth faces;
at least one conductive layer having a fifth face fixed to the second face and a sixth face fixed to the third face;
a mixer ring of type 3 (λ/2) located on the first face;
a first waveguide located on the first face and connected to a first point of the outside of the mixer ring;
a second waveguide located on the first face and connected to a second point of the outside of the mixer ring at (λ/2) from the first point;
a third waveguide positioned on the fourth face;
a first diode positioned in a first hole passing through the two dielectric layers and the conductive layer and directly connected by its cathode at a third point of the mixer ring at (λ/4) from the second point on one side of said point, and by its anode to the third guide; and
a second diode positioned in a second hole passing through the two dielectric layers and the conductive layer and directly connected by its anode to a fourth point of the mixer ring at (λ/4) from the second point on the other side of said point, and by its cathode to the third guide.

4,377,006

IR REMOTE CONTROL SYSTEM

Johnny Collins, Oak Park, and Melvin C. Hendrickson, Elmhurst, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 12, 1979, Ser. No. 57,053
Int. Cl.³ H04B 9/00
U.S. Cl. 455—603 14 Claims

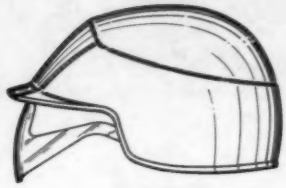


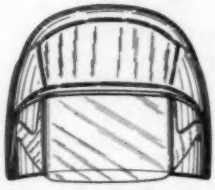
13. A receiver for use in a remote control system of the type wherein a single transmitted pulse represents a first logic state data bit and a grouping of at least two relatively closely spaced transmitted pulses represents the complementary logic state, said receiver comprising:
means for receiving the transmitted pulses representing said first and complementary state data bits;
means integrating said received pulses, said integrating means being responsive to the first leading edge of the received pulse or pulses representing each of said bits for developing a control signal delayed in time with respect thereto and having a duration overlapping the leading edge of the second received pulse of each of said groupings of at least two relatively closely spaced pulses; and
means responsive to said delayed control signals and to said received pulses for developing a multibit logic signal representing the data bits corresponding to said transmitted pulses, said logic signal comprising said complementary state data bit in response to the existence of an overlapping condition between one of said control signals and a leading edge of the associated received pulse or pulses and otherwise comprising said first state data bit.

DESIGNS

MARCH 15, 1983

268,220
MILITARY HELMET WITH VISOR
Elwyn R. Gooding, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.
Filed Jan. 7, 1981, Ser. No. 222,968
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—232



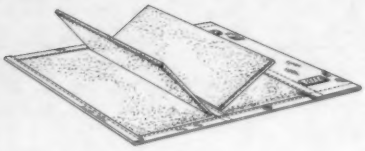


268,221
SHOE SOLE
James P. Argyropoulos, Marina del Rey, Calif., assignor to Cherokee Shoe Company, Inc., Gardena, Calif.
Filed Feb. 5, 1981, Ser. No. 231,620
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

268,222
GLOVE
Yi-yi Chen, 3rd Floor, 64-75 Henghsin Rd., Hsichih Township, Taipei Hsien, Taiwan Province, Taiwan
Filed Oct. 1, 1980, Ser. No. 192,982
Term of patent 14 years
Int. Cl. D02—*06*
U.S. Cl. D2—367

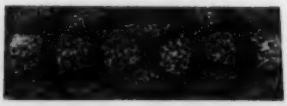
268,223
WOOD CARRIER
David J. Faulkner, 360 Riverview Rd., Rexford, N.Y. 12148
Filed Jul. 7, 1980, Ser. No. 166,300
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1

268,224
FISHING LURE HOLDER
Tom Huntebrinker, Jackson County, Mo., and William B. Kircher, Johnson County, Kans., assignors to North Fork Industries, Inc., Kansas City, Mo.
Filed Feb. 2, 1981, Ser. No. 230,511
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—38



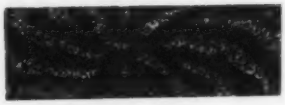
268,225
COMBINED BRUSH AND COMB
Bernard Ellenson, Tenafly, N.J., assignor to Clairol Incorporated, New York, N.Y.
Filed Dec. 15, 1980, Ser. No. 216,583
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D4—21

268,226
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,008
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1



268,227
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,009
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1

268,228
PAINT ROLLER
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,010
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1



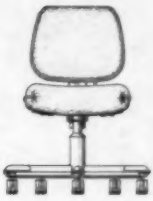
268,229
PAINT ROLLER
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,011
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1

268,230
PAINT ROLLER
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,012
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1

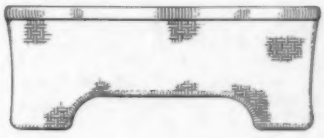
268,231
PAINT ROLLER
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Apr. 8, 1981, Ser. No. 252,013
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38.1

268,232
BABY EXERCISER
Mary E. Scales, 168 E. 64 Ave., Vancouver, British Columbia, Canada (V5X 2M4)
Filed Jan. 9, 1981, Ser. No. 223,806
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—5

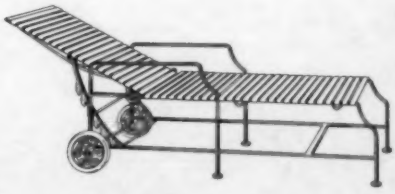
268,233
CHAIRS
William I. Stephens, Emmaus, Pa., assignor to Knoll International, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 108,961, Jan. 18, 1980, and a continuation-in-part of Ser. No. 62,006, Jul. 30, 1979, and a continuation-in-part of Ser. No. 38,124, May 11, 1979. This application Mar. 28, 1980, Ser. No. 134,763
The portion of the term of this patent subsequent to Jun. 15, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30



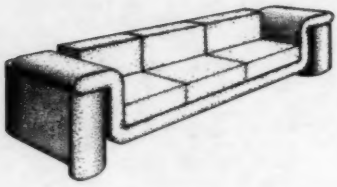
268,234
OTTOMAN
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Apr. 28, 1980, Ser. No. 144,388
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—36



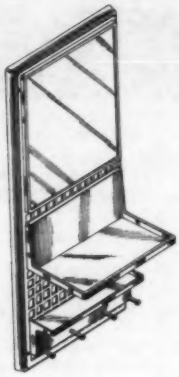
268,235
CHAISE
Gregory D. Bergquist, Mountain Brook, Ala., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Sep. 9, 1980, Ser. No. 185,649
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



268,236
COUCH
Marilyn M. Stern, 2336 California St., NW, Washington, D.C. 20008
Filed Feb. 17, 1981, Ser. No. 234,495
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

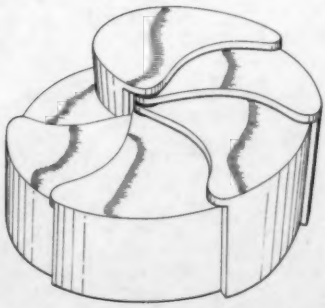


268,238
COMBINED STORAGE UNIT AND MIRROR THEREFOR
Anthony J. Brescia, Liverpool, and Spencer Rhoads, Baldwinsville, both of N.Y., assignors to Syroco, Inc., Syracuse, N.Y.
Filed Apr. 1, 1981, Ser. No. 249,853
Term of patent 14 years
Int. Cl. D6—*04, 07*
U.S. Cl. D6—136

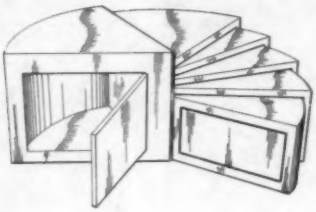


268,237
WALL MOUNTED PRIZE RIBBONS DISPLAY RACK
Arynne Simon, 6606 Grulla St., Rancho La Costa, Calif. 92008
Filed May 23, 1980, Ser. No. 152,896
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—114

268,239
EXTENSIBLE TABLE
Garbriella Crespi, Via Montenapoleone, 2, Milan, Italy
Filed Feb. 2, 1981, Ser. No. 230,493
Claims priority, application Italy, Aug. 5, 1980, 22512/80[U]
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

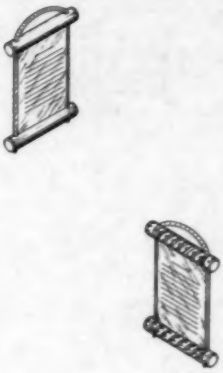


268,240
EXTENDIBLE TABLE OR SIMILAR ARTICLE
Garbriella Crespi, Via Montenapoleone, 2, Milan, Italy
Filed Feb. 2, 1981, Ser. No. 230,494
Claims priority, application Italy, Aug. 5, 1980, 22513/80[U]
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178



268,241
CHAIR PANEL
James W. Hull, 16961 Concord La., Huntington Beach, Calif. 92647
Filed Jul. 7, 1980, Ser. No. 166,377
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191

268,242
FRAME
Albert J. Fitchett, 109 N. River Dr., Pennsville, N.J. 08070
Filed May 22, 1981, Ser. No. 266,519
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242



268,243
SPATULA OR SIMILAR ARTICLE
Andre Morin, Dollard des Ormeaux, Canada, assignor to Les Industries Provinciales Limitee, Comte Bellechasse, Canada
Filed Mar. 12, 1981, Ser. No. 243,260
Claims priority, application Canada, Jan. 19, 1981, 19-01-81-12
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—102

268,244

LADLE OR SIMILAR ARTICLE

Andre Morin, Dollard des Ormeaux, Canada, assignor to Les Industries Provinciales Limitee, Comte Bellechasse, Canada

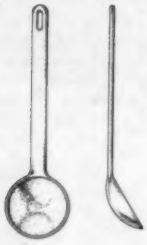
Filed Mar. 12, 1981, Ser. No. 243,258

Claims priority, application Canada, Jan. 19, 1981, 19-01-81-14

Term of patent 14 years

Int. Cl. D07—*04*

U.S. Cl. D7—104



268,245

WINE CORK REMOVER

Katsuhiko Makino, Hirakata, and Yoshitaka Inoue, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

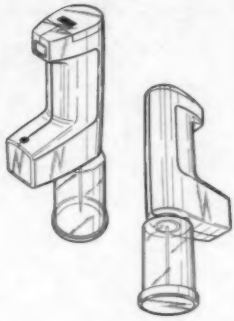
Filed Oct. 31, 1980, Ser. No. 202,817

Claims priority, application Japan, May 8, 1980, 55-18261

Term of patent 14 years

Int. Cl. D07—*06*

U.S. Cl. D8—42



268,246

ESCUTCHEON

Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.

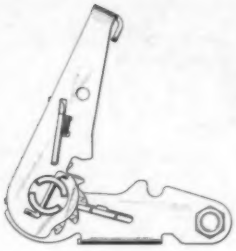
Filed Dec. 16, 1980, Ser. No. 217,168

Term of patent 14 years

Int. Cl. D8—*09*

U.S. Cl. D8—351

268,247
RATCHET BUCKLE
Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.
Filed Aug. 1, 1960, Ser. No. 174,368
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—383



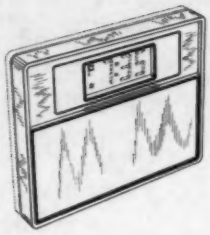
268,248
BOTTLE
Francis Bonnefoy, Fontainebleau, France, assignor to Etablissements Georges Monin, Bourges, France
Filed Feb. 26, 1981, Ser. No. 238,461
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—372

268,249
CONTAINER FOR BULK LIQUIDS
James H. Goedken, Beatrice, Nebr., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Feb. 25, 1981, Ser. No. 238,006
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—375

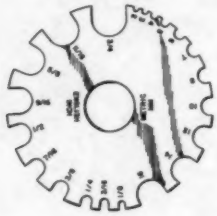
268,250
TAB FOR AN EASY OPENING CAN END
George F. Smyth, Los Angeles, Calif., assignor to Ermal C. Fraze, Dayton, Ohio
Division of Ser. No. 17,157, Mar. 2, 1979, Pat. No. Des. 261,364. This application Nov. 24, 1980, Ser. No. 209,699
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—438

268,251
PACKAGE INSERT
Richard C. Savage, Townsend, Mass., assignor to United Brands Company, New York, N.Y.
Filed Jul. 29, 1980, Ser. No. 173,295
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—456

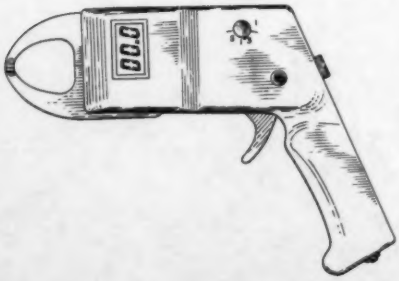
268,252
CLOCK THERMOSTAT HOUSING
Richard G. Chambers, Portland, Oreg., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 20, 1980, Ser. No. 208,758
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60



268,253
BOLT AND SCREW SIZER GAGE
Gary W. Kennedy, 1112 Fourth Ave., NW., Arab, Ala. 35016
Filed Aug. 18, 1980, Ser. No. 178,928
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

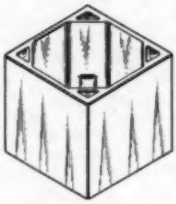


268,254
CALIPER TYPE BODY FAT CALCULATOR
Charles W. Caldwell, 875 E. Elm St., and William B. Justiss, 280 S. Hill St., both of Fayetteville, Ark. 72701
Filed Nov. 7, 1980, Ser. No. 204,919
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

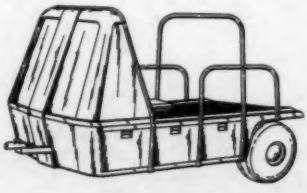


268,255
PLANTER BOWL
Martin J. Waterfield, Birmingham, Mich., assignor to Florists' Transworld Delivery Association, Southfield, Mich.
Filed Apr. 28, 1980, Ser. No. 144,065
Term of patent 7 years
Int. Cl. D11—*02*; D7—*01*
U.S. Cl. D11—152

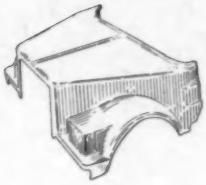
268,256
PLANTER
Paul D. Peterson, 3310 Azahar Pl., Rancho La Costa, Calif. 92008
Filed Sep. 12, 1979, Ser. No. 74,880
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



268,257
AMBULANCE TRAILER OR THE LIKE
Carl Horton, Upper Arlington, Ohio, assignor to The Horton Company, Columbus, Ohio
Filed Sep. 2, 1980, Ser. No. 183,237
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—105



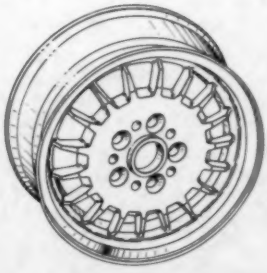
268,258
COMBINED HOOD, FENDERS AND HEADLIGHT HOUSING UNIT
Kent W. Fisk, 18474 Grandview Ave., Devore, Calif. 92407
Continuation-in-part of Ser. No. 875,767, Feb. 7, 1978, abandoned. This application Sep. 25, 1979, Ser. No. 78,837
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—164



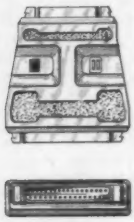
268,259
FRONT PANEL FOR A TRUCK
John C. Lindsley, Felton, Calif., assignor to Paccar Inc., Bellevue, Wash.
Continuation-in-part of Ser. No. 105,266, Dec. 19, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,814
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—196

268,260
WHEEL FOR MOTOR VEHICLE
Hans Kerschbaum, Oberdachstetten, and Klaus V. Gevert, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Mar. 16, 1981, Ser. No. 243,773
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, MR 12261
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

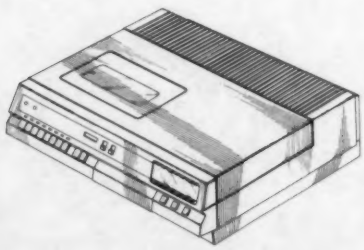
268,261
WHEEL FOR MOTOR VEHICLE
Boyke Boyer, Wessling, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Dec. 23, 1980, Ser. No. 219,868
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, MR 12183
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



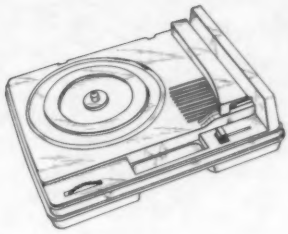
268,262
SWITCHED ADAPTER FOR ELECTRICAL CONNECTOR
Robert H. Frantz, Newville, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 17, 1979, Ser. No. 104,482
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



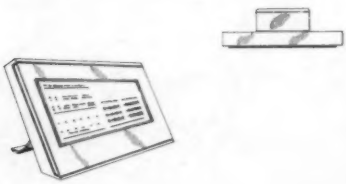
268,263
VIDEO CASSETTE RECORDER OR THE LIKE
W. Craig Bullock, Glendora; Francis J. Reid, San Dimas; Oliver T. Tetirick, and Robert R. Tripp, both of Orange, all of Calif., assignors to Odetics, Inc., Anaheim, Calif.
Filed Dec. 18, 1980, Ser. No. 217,661
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



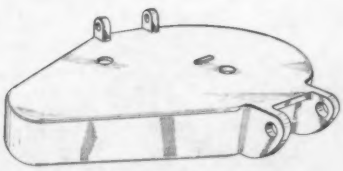
268,264
PHONOGRAPHIC TURNTABLE
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 31, 1979, Ser. No. 108,398
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17



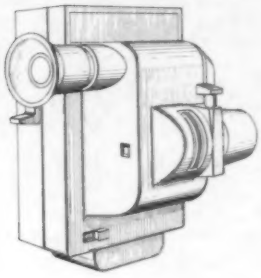
268,265
TELEPHONE LINE AND TRUNK STATUS DISPLAY
J. Scott Gibson, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada
Filed Nov. 3, 1980, Ser. No. 203,768
Claims priority, application Canada, Sep. 17, 1980, 17-09-80-4
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58



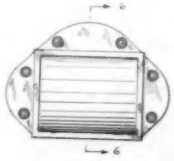
268,266
PULLEY AND BELT GUARD FOR A PORTABLE BAG CLOSING SEWING MACHINE
David B. Johnson, and Verdell H. Schroeder, both of Minneapolis, Minn., assignors to Bliss & Laughlin Industries, Incorporated, Minneapolis, Minn.
Filed Feb. 11, 1980, Ser. No. 120,569
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—72



268,267
PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
Enrique Alie, Brooklyn, N.Y.; Donald R. Bishop, Westwood, Mass., and James M. Ryan, New York, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Oct. 23, 1980, Ser. No. 199,853
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1

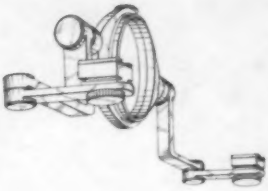


268,268
PHOTOGRAPHIC EXPOSURE CHAMBER
Eugene Gasperini, 6906 W. Berwyn, Chicago, Ill. 60656
Filed Aug. 13, 1979, Ser. No. 66,066
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—10



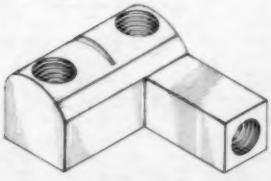
268,269
COLLATOR FOR USE WITH COPIER
Michio Imada, Kodaira, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Oct. 9, 1980, Ser. No. 195,482
Claims priority, application Japan, Apr. 15, 1980, 55-14828
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32

268,270
ADJUSTABLE PHOTOFLASH HOLDER
Roland S. Östlund, Furusliitten 60, S-430 81 Billdal, and Rolf S. Östlund, Tridesvägen 15, Skepplanda, S-466 00 Älvängen, both of Sweden
Filed Nov. 26, 1980, Ser. No. 210,390
Claims priority, application Sweden, Jun. 3, 1980, 80-1115
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—47

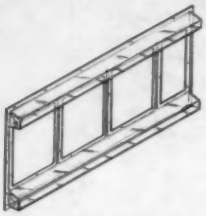


268,271
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-Sur-Glane, Switzerland
Filed May 12, 1981, Ser. No. 263,086
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—102

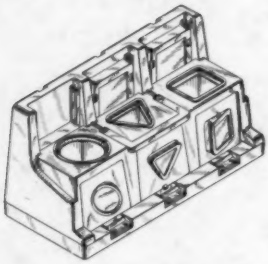
268,272
SADDLE FOR BASS GUITAR BRIDGE OR SIMILAR ARTICLE
C. Leo Fender, 2851 Rolling Hills Dr. Sp. 33, Fullerton, Calif. 92635
Filed Apr. 18, 1980, Ser. No. 141,692
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



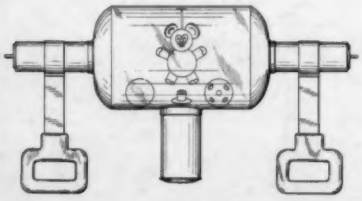
268,273
HOLDER FOR DISPLAYING DISCRETE PORTIONS OF MULTIPLE INDICIA SIGN ROLLS
Gary P. George, St. Louis, Mo., assignor to Stout Industries, Inc., St. Louis, Mo.
Filed Oct. 9, 1980, Ser. No. 195,324
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—44



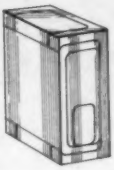
268,274
MULTIPLE ELEMENT POP-UP TOY
Sheldon Greenberg, New York, N.Y., assignor to Shelcore, Inc., Piscataway, N.J.
Filed Dec. 1, 1980, Ser. No. 211,635
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59



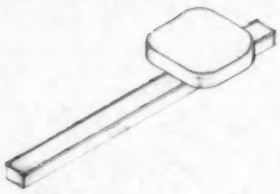
268,275
INFLATABLE CRIB GYM TOY
Sheldon Greenberg, New York, N.Y., assignor to Shelcore, Inc., Piscataway, N.J.
Filed Nov. 12, 1980, Ser. No. 206,267
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—63



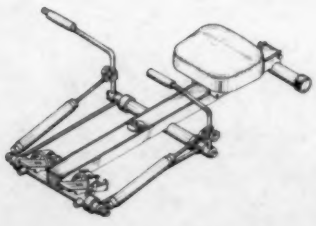
268,276
EDUCATIONAL FURNITURE PUZZLE OR SIMILAR ARTICLE
Ivan Rados, Intagsgränd 56, S-163 57 Spanga, Sweden
Filed Aug. 1, 1979, Ser. No. 62,645
Claims priority, application Sweden, Feb. 1, 1979, 7900026
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—107



268,277
COMBINED MAIN BEAM AND SEAT CARRIAGE FOR A ROWING MACHINE
David B. Smith, P.O. Box 1280, Bellevue, Wash. 98009
Filed Apr. 13, 1981, Ser. No. 253,781
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

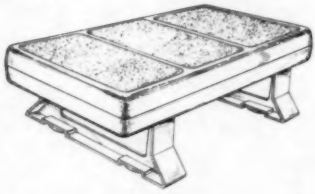


268,278
ROWING MACHINE
David B. Smith, 3811 W. Mercer Way, Mercer Island, Wash. 94040
Continuation-in-part of Ser. No. 253,785, Apr. 13, 1981, and a continuation-in-part of Ser. No. 253,781, Apr. 13, 1981. This application Mar. 1, 1982, Ser. No. 353,054
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195

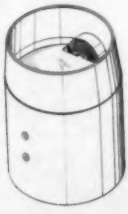


268,279
PLAY SPRINKLER OR THE LIKE
Douglas A. Geller, Monrovia, and David C. McElroy, South Pasadena, both of Calif., assignors to Wham-O-Mfg. Co., San Gabriel, Calif.
Continuation-in-part of Ser. No. 70,339, Aug. 27, 1979. This application Feb. 2, 1981, Ser. No. 230,857
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—9

268,280
BATH SEAT
Michael Rodger, Loughborough, England, assignor to Gordon Ellis and Company, Derby, England
Filed Jan. 29, 1981, Ser. No. 229,426
Claims priority, application United Kingdom, Nov. 28, 1980, 997799
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D23—71

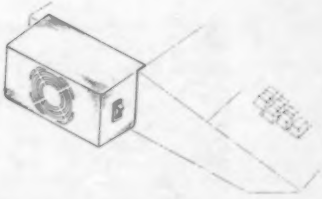


268,281
DAMPER
John Prikkel, III, 2952 Ensley Ave., Dayton, Ohio 45414
Filed Sep. 26, 1979, Ser. No. 78,968
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



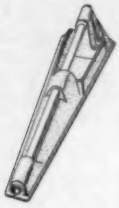
268,282
FUME CAPTURE HOOD
Frederick R. Wichmann, Cincinnati, and James C. Bricker, Waynesville, both of Ohio, assignors to United Air Specialists, Inc., Cincinnati, Ohio
Filed Jul. 7, 1980, Ser. No. 166,304
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151

268,283
FAN ENCLOSURE
Roy T. Hicks, 566 Irelan, Buellton, Calif. 93427
Filed Apr. 9, 1982, Ser. No. 367,012
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155

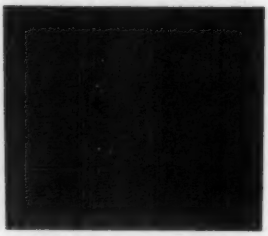


268,284
PARENTERAL FLUID ADMINISTRATION INSTRUMENT
Joseph J. Manno; Robert B. Truitt, both of San Diego, and Richard B. Conley, Jamul, all of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Nov. 7, 1980, Ser. No. 204,770
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8

268,285
MOLDED PLASTIC DECONTAMINATION STAND FOR BRONCHOFIBERSCOPES
Walter H. Zinnecker, 9626 Radio Rd., Houston, Tex. 77075
Filed Sep. 3, 1980, Ser. No. 184,256
Term of patent 14 years
Int. Cl. D24—*02;* D6—*02*
U.S. Cl. D24—31

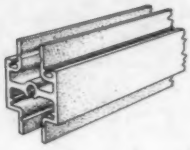


268,286
POST OPERATIVE SURGICAL BINDER/SURGICAL DRESSING FABRIC OF THE PLUSH BACK TYPE
Tate H. Brown, P.O. Box 206, Lewisburg, W. Va. 24901
Filed Oct. 3, 1980, Ser. No. 193,477
Term of patent 14 years
Int. Cl. D24—*04;* D5—*05*
U.S. Cl. D24—49

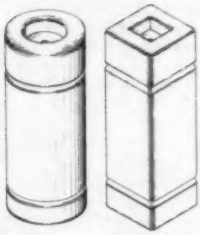


268,287
ULTRAVIOLET LAMP
Armando Boschetti, Bryan, Ohio, assignor to Paul B. Elder Company, Bryan, Ohio
Filed Nov. 16, 1978, Ser. No. 961,216
Term of patent 14 years
Int. Cl. D24—*04;* D26—*05;* D24—*68*
U.S. Cl. D24—68

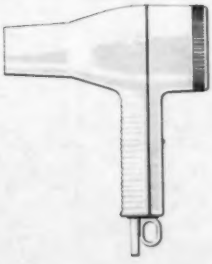
268,288
SECTION FOR USE IN A DISPLAY APPARATUS
Thorp C. Cowdroy, Sydney, Australia, assignor to Clive Investments Pty. Ltd., Australia
Filed Dec. 29, 1980, Ser. No. 220,570
Term of patent 14 years
Int. Cl.—D25*/01*
U.S. Cl. D25—74



268,289
ASHTRAY
Grant V. Diebold, 7328B Stewart and Gray Rd., Downey, Calif. 90241
Filed Jun. 13, 1980, Ser. No. 159,232
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—10

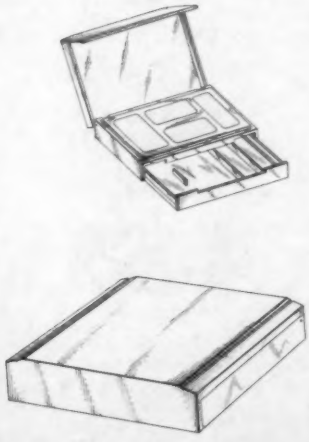


268,290
HAIR DRYER
Roderick McBrien, Poole, England, assignor to F.C.F. Limited, Poole, England
Filed Dec. 16, 1980, Ser. No. 217,100
Claims priority, application United Kingdom, Sep. 4, 1980, 80996427
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



268,291
RAZOR HANDLE
Graham R. Jones, Twickenham, England, assignor to Wilkinson Sword, Limited, Buckinghamshire, England
Filed Feb. 4, 1981, Ser. No. 231,551
Claims priority, application United Kingdom, Aug. 8, 1980, 80996070
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

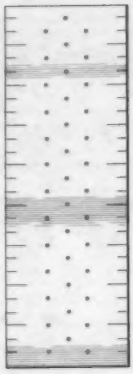
268,292
BOX FOR COSMETIC PRODUCTS OR THE LIKE
Alain Chevassus, Sceaux, France, assignor to Lefebure Isolants Reunis, Rungis, France
Filed Dec. 18, 1980, Ser. No. 217,788
Claims priority, application France, Jun. 24, 1980, 94150
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83



268,293
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Feb. 18, 1981, Ser. No. 235,693
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 1006/80
Term of patent 14 years
Int. Cl. D05—*05*
U.S. Cl. D47—6 E

268,294
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Feb. 18, 1981, Ser. No. 235,767
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, URA 1006/80
Term of patent 14 years
Int. Cl. D05—*05*
U.S. Cl. D47—6 E

268,295
SHEET FOR WRAPPING COILED ROD OR SIMILAR ARTICLE
Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.
Filed Dec. 24, 1980, Ser. No. 219,626
Term of patent 14 years
Int. Cl. D05—*06*
U.S. Cl. D59—2 C



268,296
WALL COVERING
Danica Polak, Paris, France, assignor to Peintures Corona S.A., Valentiennes, France
Filed Nov. 10, 1980, Ser. No. 205,762
Claims priority, application France, May 9, 1980, 801516
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—25

268,297
WALL COVERING
Danica Polak, Paris, France, assignor to Peintures Corona S.A., Valentiennes, France
Filed Nov. 10, 1980, Ser. No. 205,763
Claims priority, application France, May 9, 1980, 801516
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—25

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MARCH, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Carter, Inc.: *See*—
Hudgins, Herbert E., 4,376,603, Cl. 409-140.000.

A. E. Staley Manufacturing Company: *See*—
Holbrook, James L.; and Hanover, Laren M., 4,376,791, Cl. 426-565.000.

Aardse, Henri J., to B.V. Gaba. Device for tresting teeth. 4,376,628, Cl. 433-80.000.

AB Volvo: *See*—
Janiszewski, Gregorz K., 4,376,475, Cl. 192-53.00F.
Pilhall, Stig T. L., 4,376,552, Cl. 297-391.000.

Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., to Rockwell International Corporation. Muldem with monitor comparing means which accepts different data rates. 4,376,998, Cl. 370-13.000.

Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., to Rockwell International Corporation. Muldem with monitor testing on-line and off-line paths. 4,376,999, Cl. 370-16.000.

Abe, Hideaki; and Yamashita, Koji, to Nippon Electric Co., Ltd. Testing device for electronic circuits and especially for portable radios. 4,377,003, Cl. 455-90.000.

Abe, Hiroshi, to Asahi Seiko Co., Ltd. Coin sorting device. 4,376,480, Cl. 194-101.000.

Acardi, Paul J., Jr. Shoe last rack. 4,376,486, Cl. 211-35.000.

ACF Industries, Incorporated: *See*—
Shelton, William S., 4,376,524, Cl. 251-86.000.

Ackeret, Peter, to Licinvest AG. Picture viewer. 4,376,348, Cl. 40-513.000.

Adriel Energy Corporation: *See*—
Weinberger, Theodor, 4,376,636, Cl. 44-56.000.

Advanced Technology, Inc.: *See*—
Intrater, Josef; and Bertoldo, Gene, 4,376,806, Cl. 428-469.000.

Aeronca Electronics, Inc.: *See*—
Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., 4,376,583, Cl. 356-237.000.

Aerospace Corporation, The: *See*—
Katzman, Howard A., 4,376,803, Cl. 428-408.000.
Katzman, Howard A., 4,376,804, Cl. 428-408.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Charpak, Georges; Hoan, N'Guyen N.; Policarpo, Armando; and Sauli, Fabio, 4,376,892, Cl. 250-372.000.

Agricultural Aviation Engineering Co.: *See*—
Haddad, Albert G., 4,376,404, Cl. 84-464.00R.

Aisan Industry Co., Ltd.: *See*—
Takada, Shigetaka; and Watanabe, Yukihiro, 4,376,430, Cl. 123-438.000.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic wristwatch with alarm function. 4,376,992, Cl. 368-47.000.

Akagawa, Masaki: *See*—
Sugimoto, Osamu; and Akagawa, Masaki, 4,376,478, Cl. 194-1.00N.
Sugimoto, Osamu; and Akagawa, Masaki, 4,376,479, Cl. 194-1.00N.

Akagi, Akio: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakamori, 4,376,656, Cl. 106-309.000.

Akai, Naoto, to Jujo Engineering Co., Ltd. Apparatus for dividing stacked sheets and for feeding out the same. 4,376,530, Cl. 271-10.000.

Aktiebolaget Bofors: *See*—
Hallqvist, Sten; and Eriksson, Erik, 4,376,407, Cl. 89-20.00R.

Akzo N.V.: *See*—
de Graaf, Johannes, 4,376,730, Cl. 260-205.000.

Akzona Incorporated: *See*—
Beyleveld, Wilhelmus M.; and Roskott, Lodewijk, 4,376,842, Cl. 525-27.000.
Roskott, Lodewijk, 4,376,841, Cl. 525-23.000.
Stanley, Keith D., 4,376,736, Cl. 260-462.00R.

Al-Hajry, Mohammed N.: *See*—
Howse, Clifford G., 4,376,797, Cl. 427-302.000.

Albany International Corp.: *See*—
Hahn, Edward R., 4,376,455, Cl. 139-383.00A.

Alexander, Steven: *See*—
Szilagyi, Imre; and Alexander, Steven, 4,376,906, Cl. 313-332.000.

Alfa-Laval AB: *See*—
Skoog, Malte, 4,376,460, Cl. 165-167.000.

Alfa-Laval, Inc.: *See*—
Schulte, Klaus, 4,376,454, Cl. 137-798.000.

Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., to Aeronca Electronics, Inc. Surface inspection scanning system. 4,376,583, Cl. 356-237.000.

Ali, Mohammad H., to United States Gypsum Company. Method of manufacturing flame and abuse resistant fiber panel and products resulting. 4,376,674, Cl. 162-136.000.

Aliva Aktiengesellschaft: *See*—
Egli, Ernst, 4,376,600, Cl. 406-63.000.

All American Fuel Systems: *See*—
Spakowski, Paul A., 4,376,433, Cl. 123-478.000.

Allard, Wayne H. Warming device and method for a heating system. 4,376,510, Cl. 237-2.00B.

Allen, Neil W., to Standard Oil Company (Indiana). Seafloor diverter. 4,376,467, Cl. 175-7.000.

Allied Corporation: *See*—
Marshall, Robert M., 4,376,802, Cl. 428-378.000.

Allis-Chalmers Corporation: *See*—
Dunseith, S. Michael, 4,376,638, Cl. 55-20.000.
Hochwitz, Lynn E., 4,376,345, Cl. 37-260.000.

Altherr, Russell G., to Amsted Industries Incorporated. Railway coupler carrier assembly. 4,376,488, Cl. 213-61.000.

American Can Company: *See*—
Dao, Tan K.; Gold, Vance B.; Kubacki, Edward F.; and Sieverin, Walter J., 4,376,883, Cl. 219-109.000.
Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, 4,376,884, Cl. 219-109.000.
Schulz, Galyn A., 4,376,671, Cl. 156-549.000.

American Hoechst Corporation: *See*—
Partos, Richard D., 4,376,678, Cl. 203-9.000.
Walls, John E., 4,376,814, Cl. 430-272.000.

Ames, Stanley R., to Eastman Kodak Company. Feed supplement for ruminant animals. 4,376,790, Cl. 426-2.000.

Ames, William A., to Eastman Kodak Company. Emulsifiable ethylene containing polyolefin waxes having improved emulsifiability and process for their preparation. 4,376,855, Cl. 528-271.000.

Ametek, Inc.: *See*—
Ward, John; Austin, Robert; and Genovese, Anthony, 4,376,746, Cl. 264-167.000.

Amin, Kamal E., to Bendix Corporation, The. Method for inducing superplastic properties in nonsuperplastic metal and alloy powders. 4,376,660, Cl. 148-11.50P.

Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan, to ELFAB Corporation. Method and apparatus for orienting integrated circuit clips and sockets and assembling them into connector contacts. 4,376,339, Cl. 29-876.000.

AMP Incorporated: *See*—
Bird, Philip S.; and O'Neill, Christopher J., 4,376,565, Cl. 339-186.00M.
Kaley, Robert C., 4,376,562, Cl. 339-75.00M.
Olson, Billy E.; Kunkle, James R.; and Kam, Lit-Yan, 4,376,560, Cl. 339-17.0CF.

Ampex Corporation: *See*—
Brown, Hugh B.; Noble, Stephen C.; and Markevitch, Bob V., 4,376,950, Cl. 358-90.000.

Amsted Industries Incorporated: *See*—
Altherr, Russell G., 4,376,488, Cl. 213-61.000.

Anatol, Andre-Manuel, legal representative: *See*—
Anatol, Jesus, deceased; Anatol, Marie-Francoise, legal representative; Anatol, Andre-Manuel, legal representative; Berecoechea, Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, 4,376,783, Cl. 424-300.000.

Anatol, Jesus, deceased; by Anatol, Marie-Francoise, legal representative; by Anatol, Andre-Manuel, legal representative; Berecoechea, Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, to Compagnie Francaise de Sucerie. Acylated guanidines and medicaments containing them. 4,376,783, Cl. 424-300.000.

Anatol, Marie-Francoise, legal representative: *See*—
Anatol, Jesus, deceased; Anatol, Marie-Francoise, legal representative; Anatol, Andre-Manuel, legal representative; Berecoechea, Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, 4,376,783, Cl. 424-300.000.

Anelva Corporation: *See*—
Tsukada, Tsutomu; and Ukai, Katsumi, 4,376,692, Cl. 204-298.000.

Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., to United States of America, Energy. Method for primary containment of cesium wastes. 4,376,792, Cl. 427-6.000.

Anodex: *See*—
Passovoy, Richard H., 4,376,354, Cl. 49-504.000.

Antonov, Anatoly V.: *See*—
Safonnikov, Anatoly N.; and Antonov, Anatoly V., 4,376,881, Cl. 219-73.100.

Aoi, Takaaki: *See*—
Uchino, Hideo; Nomura, Masami; Aoi, Takaaki; and Kanbe, Masumi, 4,376,471, Cl. 187-29.00R.

Apanel, George J., to Lummus Company, The. Production of epoxy compounds from olefinic compounds. 4,376,865, Cl. 549-521.000.

Applied Materials, Inc.: *See*—
Wang, David N.; Egitto, Frank D.; and Maydan, Dan, 4,376,672, Cl. 156-643.000.

Aqua-Chem, Inc.: *See*—
Liu, Philip J., 4,376,679, Cl. 203-71.000.

Ardal og Sunndal Verk a.s.: *See*—
Landmark, Jonas R.; and Schneider, Paul A., 4,376,602, Cl. 406-115.000.

Arifian, Kenneth C.: *See*—
Fowler, Donald W.; and Arifian, Kenneth C., 4,376,979, Cl. 364-424.000.

Arima, Shizuo: *See*—
Toyoda, Akira; Arima, Shizuo; Nozawa, Katsumi; and Igarashi, Kenji, 4,376,618, Cl. 417-417.000.

Armstrong, Kenneth W. End fittings for conduits. 4,376,548, Cl. 285-149.000.

Arnold, Wesley D., Jr.: *See*—
Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., 4,376,792, Cl. 427-6.000.

Arora, Mulk R., to Sprague Electric Company. AC Etching of aluminum capacitor foil. 4,376,686, Cl. 204-129.850.

Arrasmith, Robert D.; Barnhart, Thomas R.; and Goldman, Jon C., to Thermco Products Corporation. Processing silicon wafers employing processing gas atmospheres of similar molecular weight. 4,376,796, Cl. 427-82.000.

Aruga, Taketo: *See*—
Kojima, Yasuo; Morita, Koichi; Hoashi, Kenzo; and Aruga, Taketo, 4,376,371, Cl. 60-420.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hayashi, Yoshio; Onuma, Akira; and Shiga, Tetsuo, 4,376,816, Cl. 430-347.000.
Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, 4,376,687, Cl. 204-181.00C.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,376,720, Cl. 252-430.000.

Asahi Seiko Co., Ltd.: *See*—
Abe, Hiroshi, 4,376,480, Cl. 194-101.000.

Asea Aktiebolag: *See*—
Engstrom, Olof; and Ovren, Christer, 4,376,890, Cl. 250-227.000.

Ashland Oil, Inc.: *See*—
Myers, deceased; George D., 4,376,696, Cl. 208-120.000.

Ashton, Larry J., to Little Giant Industries, Inc. Fiberglass ladder. 4,376,470, Cl. 182-23.000.

Austin, Robert: *See*—
Ward, John; Austin, Robert; and Genovese, Anthony, 4,376,746, Cl. 264-167.000.

Avellanet, Frank J.; Battey, Robert L.; and Burtrem, Lloyd J., to Burroughs Corporation. Multi-ply unglued paper drive apparatus. 4,376,589, Cl. 400-606.000.

Azegami, Hitoshi: *See*—
Ishida, Toshihiko; Azegami, Hitoshi; and Kawakami, Yoshio, 4,376,519, Cl. 242-199.000.

Bacevius, Joseph G. Clamping light construction and clamping means therefor. 4,376,965, Cl. 362-191.000.

Badger, Everett H.; and Rogerson, Michael J., to Rogerson Aircraft Controls. Vacuum flush valve. 4,376,315, Cl. 4-431.000.

Bagaric, Stjepan: *See*—
Van Soest, Cornelius J. M.; Muller, Rostislav; and Bagaric, Stjepan, 4,376,487, Cl. 212-147.000.

Bahr, Dietrich J.; and Briska, Marian, to International Business Machines Corporation. Record carrier for an electro-erosion printer and method for making same. 4,376,943, Cl. 346-135.100.

Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG: *See*—
Lange, Karl-Heinz, 4,376,574, Cl. 354-147.000.

Baldacci, John W., to Felt Products Mfg. Co. Head gasket assembly for diesel engines. 4,376,539, Cl. 277-1.000.

Banda, Shunji, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device. 4,376,567, Cl. 350-335.000.

Bandar, Beverly. Thermal retention container. 4,376,558, Cl. 312-259.000.

Banker, Harold, Jr., to NER Data Products, Inc. Flexible membrane container closure. 4,376,491, Cl. 220-200.000.

Banks, Harold H., to Kidde, Inc. Aircraft seat. 4,376,522, Cl. 248-503.100.

Banks, Robert L.: *See*—
Hogan, John P.; and Banks, Robert L., 4,376,851, Cl. 526-351.000.

Banks, Russell; and Magid, David J., to Enviro-Spray Systems, Inc. Expandable bag. 4,376,500, Cl. 222-386.500.

Bantz, David F.; Choquet, Michel F.; and Rosenfeld, Jack L., to International Business Machines Corporation. Protocol for inter-processor dialog over a communication network. 4,376,982, Cl. 364-900.000.

Baranski, Andrzej S.: *See*—
Fawcett, William R.; and Baranski, Andrzej S., 4,376,682, Cl. 204-14.00N.

Barkow, William H.: *See*—
Gross, Josef; Barkow, William H.; and Mirsch, John W., 4,376,924, Cl. 335-210.000.

Barltrop, John A.; Bird, Colin L.; and Collins, Gilbert C. S., to International Business Machines Corporation. Electrolyte for an electrochromic display. 4,376,569, Cl. 350-357.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz, 4,376,517, Cl. 242-47.000.

Barnhart, Thomas R.: *See*—
Arrasmith, Robert D.; Barnhart, Thomas R.; and Goldman, Jon C., 4,376,796, Cl. 427-82.000.

Baroncelli, Vittorio: *See*—
Giannini, Ivo; and Baroncelli, Vittorio, 4,376,820, Cl. 435-4.000.

Barraclough, Bruce L.: *See*—
Elliott, Guy R. B.; Barraclough, Bruce L.; and Vanderborgh, Nicholas E., 4,376,462, Cl. 166-267.000.

Bartel, Gunter; Fiedler, Horst; Stotz, Manfred; and Kleinschmit, Einhard, to Daimler-Benz A.G. Closure member for the fuel tank of an automotive vehicle. 4,376,492, Cl. 220-210.000.

Barth, Jordan; and Norfleet, James, to Colgate-Palmolive Company. Functional agglomerated speckles, method for manufacture thereof and dentifrices containing such speckles. 4,376,763, Cl. 424-49.000.

BASF Aktiengesellschaft: *See*—
Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, 4,376,645, Cl. 71-105.000.
Kempter, Fritz E.; and Schupp, Eberhard, 4,376,849, Cl. 525-490.000.
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.
Rentzea, Costin; Feuerherd, Karl-Heinz; Zeeh, Bernd; Sauter, Hubert; and Pommer, Ernst-Heinrich, 4,376,776, Cl. 424-267.000.
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; and Teschendorf, Hans-Juergen, 4,376,773, Cl. 424-251.000.

BASF Wyandotte Corporation: *See*—
Schmolka, Irving R., 4,376,764, Cl. 424-78.000.

Battenfeld Maschinenfabrik GmbH: *See*—
Eckardt, Helmut, 4,376,625, Cl. 425-564.000.

Battey, Robert L.: *See*—
Avellanet, Frank J.; Battey, Robert L.; and Burtrem, Lloyd J., 4,376,589, Cl. 400-606.000.

Baurain, Roger M.: *See*—
Trouet, Andre B. L.; Masquelier, Michele M. L. G.; and Baurain, Roger M., 4,376,765, Cl. 424-177.000.

Baxter Travenol Laboratories, Inc.: *See*—
Brown, R. Clark; Cotter, Richard; and Young, Susan K., 4,376,819, Cl. 435-4.000.

Bayer Aktiengesellschaft: *See*—
Kuhle, Engelbert; and Hagemann, Hermann, 4,376,735, Cl. 260-453.0RW.
Lindner, Christian; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 4,376,843, Cl. 525-83.000.
Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,376,786, Cl. 424-304.000.
Maurer, Werner; and Zimmer, Johann, 4,376,859, Cl. 544-348.000.
Raue, Roderich; and Kuhlthau, Hans-Peter, 4,376,728, Cl. 260-165.000.
Straube, Franz A.; and Lehnert, Gunther, 4,376,438, Cl. 128-90.000.

Beckmann, Otto, to Semperit Aktiengellschaft. Method of increasing the wear resistance of an elastomeric body. 4,376,667, Cl. 156-83.000.

Bedard, James F.; Cutler, Scott E.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., to General Electric Company. Control signal and isolation circuits. 4,376,969, Cl. 363-78.000.

Bedford, Robert C., to Kelley Company Inc. Maintenance lip lock. 4,376,319, Cl. 14-71.300.

Bednarz, John J.; Moser, Phillip J.; and Rosenberg, Roger L., to Circom, Inc. Automatic down rigger control system. 4,376,350, Cl. 43-26.100.

Behn, Reinhard; Pachonik, Horst; and Seebacher, Gerhard, to Siemens Aktiengesellschaft. Method for producing an improved electrical layer capacitor. 4,376,329, Cl. 29-25.420.

Behrenz, Wolfgang: *See*—
Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,376,786, Cl. 424-304.000.

Beirne, Patrick R., to Mitel Corporation. Keyless and indicatorless local telephone switching system. 4,376,875, Cl. 179-18.00B.

Beitel, George A., to United States of America, Energy. Viscous sludge sample collector. 4,376,392, Cl. 73-864.450.

Belanger, Patrice C.; and Young, Robert N., to Merck Sharp & Dohme (I.A.) Corp. N-(Substituted)-2-aza-2'-hydroxy-5,6-benzotricyclo[6.3.0^{1,5}.0^{4,11}] undecane centrally-acting analgesics. 4,376,779, Cl. 424-274.000.

Belinko, Keith; Patmore, David J.; Packwood, Rodney H.; and Ranganathan, Ramaswami, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Simultaneous demetalization and hydrocracking of heavy hydrocarbon oils. 4,376,695, Cl. 208-59.000.

Belk, Wilber C., to FMC Corporation. Citrus fruit juice extractor. 4,376,409, Cl. 99-509.000.

Bell Telephone Laboratories, Inc.: *See*—
Hart, Robert J.; and Joseph, Ralph C., 4,376,584, Cl. 356-401.000.
Kaminow, Ivan P.; and Marcuse, Dietrich, 4,376,946, Cl. 357-17.000.
Miedema, Hotze, 4,376,940, Cl. 343-840.000.

Bellos, Thomas J., to Petrolite Corporation. Flotation processes using ureylenes. 4,376,708, Cl. 210-705.000.

Bender, Frank: *See*—
Bender, H. Nelson; and Bender, Frank, 4,376,928, Cl. 337-323.000.

Bender, H. Nelson; and Bender, Frank. Adjustable temperature sensor. 4,376,928, Cl. 337-323.000.

Bendix Corporation, The: *See*—
Amin, Kamal E., 4,376,660, Cl. 148-11.50P.
Woodruff, Frank, 4,376,614, Cl. 416-32.000.

Berecoechea, Jean: *See*—
Anatol, Jesus, deceased; Anatol, Marie-Francoise, legal representative; Anatol, Andre-Manuel, legal representative; Berecoechea, Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, 4,376,783, Cl. 424-300.000.
Bergman, Raymond A.; and Hemmelgarn, Donald J. Linear bearing arrangement. 4,376,556, Cl. 308-6.00C.
Bertoldo, Gene: *See*—
Intrater, Josef; and Bertoldo, Gene, 4,376,806, Cl. 428-469.000.
Bethlehem Steel Corporation: *See*—
Clemens, Richard E., 4,376,489, Cl. 220-1.500.
Irons, Stanton D., 4,376,700, Cl. 209-17.000.
Betron, Frank A.: *See*—
Saran, Amitabh; Luzio, Guillermo F.; and Betron, Frank A., 4,376,933, Cl. 340-347.0DD.
Beyleveld, Wilhelmus M.; and Roskott, Lodewijk, to Akzona Incorporated. Novel peroxyketals derived from alkoxyacetones. 4,376,842, Cl. 525-27.000.
Bianucci, Giancarlo: *See*—
Horak, Edgardo; Casati, Alvaro; Bianucci, Giancarlo; Marafioti, Luigi; and Notarbartolo, Silvio, 4,376,680, Cl. 203-89.000.
Bicker, Uwe: *See*—
Bosies, Elmar; Heerdt, Ruth; Gall, Rudi; Bicker, Uwe; and Ziegler, Anna E., 4,376,731, Cl. 260-239.00E.
Bindin, Peter J., to Chloride Silent Power Limited. Sodium sulphur batteries and cell modules therefor. 4,376,809, Cl. 429-62.000.
Biotech Electronics Ltd.: *See*—
Verity, Nigel C., 4,376,642, Cl. 55-105.000.
Bird, Colin L.: *See*—
Baritrop, John A.; Bird, Colin L.; and Collins, Gilbert C. S., 4,376,569, Cl. 350-357.000.
Bird, Philip S.; and O'Neill, Christopher J., to AMP Incorporated. Electrical connector keying means. 4,376,565, Cl. 339-186.00M.
Birkhofer, Herbert, to Schaeffler-Homberg GmbH, Firma. Machine for attaching buttons having shanks to an article in a correctly buttoned condition. 4,376,504, Cl. 227-32.000.
Bisi, Piero: *See*—
Lagana', Vincenzo; Saviano, Francesco; and Bisi, Piero, 4,376,717, Cl. 252-376.000.
Bjurling, Anders, to Dynatrans AB. Insulated tank container. 4,376,494, Cl. 220-444.000.
Black, William L., to United States of America, Navy. Hybrid gun system. 4,376,406, Cl. 89-7.000.
Blackington, Paul A., to Sheltered Workshop for the Disabled, Inc. Fiber optic switching method and apparatus with flexible shutter. 4,376,566, Cl. 350-96.200.
Blanco, Raymond E.: *See*—
Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., 4,376,792, Cl. 427-6.000.
Blonski, Paul, to Hyde Products, Inc. Forestay connector. 4,376,417, Cl. 114-106.000.
Boas, Peter F.; and Petersen, Olfert H., to Slagteriernes Forskningsinstitut. Surface cleaning device for carcasses. 4,376,325, Cl. 17-18.000.
Boehringer Mannheim GmbH: *See*—
Bosies, Elmar; Heerdt, Ruth; Gall, Rudi; Bicker, Uwe; and Ziegler, Anna E., 4,376,731, Cl. 260-239.00E.
Bohman, Carl E.; Maguire, Hugh C.; and Thompson, Bradley J., to Sperry Corporation. Automatic spout control for agricultural machines. 4,376,609, Cl. 414-335.000.
Boise Cascade Corporation: *See*—
Westphal, Teddy M., 4,376,506, Cl. 229-5.600.
Bonati, Attilio: *See*—
Lietti, Andrea; and Bonati, Attilio, 4,376,781, Cl. 424-283.000.
Bond, Walter D.: *See*—
Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., 4,376,792, Cl. 427-6.000.
Bonin, John H.: *See*—
Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., 4,376,608, Cl. 414-217.000.
Bonner, William F.: *See*—
Brouns, Richard A.; Buelt, James L.; and Bonner, William F., 4,376,598, Cl. 405-258.000.
Booher, Richard N., to Eli Lilly and Company. Pyridyl ketone. 4,376,860, Cl. 546-268.000.
Borg-Warner Corporation: *See*—
Sousa, Alex J., 4,376,902, Cl. 310-54.000.
Valdiserri, Leo L.; and Woodbury, Richard P., 4,376,857, Cl. 544-214.000.
Wueschinski, Russel P.; and Siemon, Edward C., 4,376,968, Cl. 363-37.000.
Borzym, John J. Bevel gear drive with means to control backlash for flying ram cutoff machine. 4,376,401, Cl. 83-319.000.
Bosco, Dino: *See*—
Pagani, Giorgio; Bosco, Dino; and Brambilla, Lorenzo, 4,376,758, Cl. 423-359.000.
Bosies, Elmar; Heerdt, Ruth; Gall, Rudi; Bicker, Uwe; and Ziegler, Anna E., to Boehringer Mannheim GmbH. 1-Aziridine carboxylic acid derivatives with immunostimulant activity. 4,376,731, Cl. 260-239.00E.
Bothwell, Bruce E., to Repwell Associates, Inc. Metal-ceramic composite and method for making same. 4,376,374, Cl. 60-687.000.
Boudigues, Serge, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A. Multiple flow turbojet with adjustable bypass ratio. 4,376,375, Cl. 60-226.300.
Bouron, Pierre; Robineau, Maurice; and Thiery, Alain, to Societe Metallurgique Liotard Freres. Container. 4,376,451, Cl. 137-588.000.
Bozler, Gerhard: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,376,760, Cl. 424-1.500.
Braese, Hans-Eberhard: *See*—
Lindner, Christian; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 4,376,843, Cl. 525-83.000.
Brambilla, Lorenzo: *See*—
Pagani, Giorgio; Bosco, Dino; and Brambilla, Lorenzo, 4,376,758, Cl. 423-359.000.
Braude, Irwin A., to Meloy Laboratories, Inc. Production of human IFN-gamma (immune) interferon. 4,376,821, Cl. 435-68.000.
Braude, Irwin A., to Meloy Laboratories, Inc. Production of human IFN- γ (immune) interferon. 4,376,822, Cl. 435-68.000.
Breitschmid, Hans, to Ciba-Geigy AG. Process for the production of naphthylamine-hydroxysulphonic acids. 4,376,737, Cl. 260-509.000.
Dreuer, Oswald; and Merten, Gerhard, to Gewerkschaft Eisenhutte Westfalia. Floor cutter bit. 4,376,553, Cl. 299-34.000.
Breunig, Anton, to Heidelberger Druckmaschinen AG. Device for transporting sheets on printing machines. 4,376,531, Cl. 271-202.000.
Bridge, William A., to Dow Chemical Company, The. Method and apparatus for tube extrusion. 4,376,621, Cl. 425-72.00R.
Bridle, Michael K.: *See*—
Scott, Terrence L.; Westlake, Vincent H.; and Bridle, Michael K., 4,376,706, Cl. 210-678.000.
Briem, Karl; and Laurien, Hanno, to Zytan Thermochemische Verfahrenstechnik GmbH & Co. KG. Method for separating and removing a molded element formed by firing and pyroplastic adhesion of the material from a mold. 4,376,750, Cl. 264-336.000.
Brimm, Daniel J., to Chem-tronics, Inc. Methods for fabricating metallic workpieces. 4,376,662, Cl. 148-12.300.
Briska, Marian: *See*—
Bahr, Dietrich J.; and Briska, Marian, 4,376,943, Cl. 346-135.100.
British Petroleum Company Limited, The: *See*—
Math, Friedrich C., 4,376,669, Cl. 156-161.000.
Britton, Frederick G.; Stanfield, William G.; and Landers, Don B., to Oil States Industries, Inc. Pull-out diaphragm seal for hollow tubes. 4,376,597, Cl. 405-195.000.
Brooks, Elva M., executrix: *See*—
Lockhart, Scott N.; Hohulin, Samuel E.; and Brooks, Joseph F., deceased, 4,376,322, Cl. 15-323.000.
Brooks, Joseph F., deceased: *See*—
Lockhart, Scott N.; Hohulin, Samuel E.; and Brooks, Joseph F., deceased, 4,376,322, Cl. 15-323.000.
Brouns, Richard A.; Buelt, James L.; and Bonner, William F., to United States of America, Energy. In-situ vitrification of soil. 4,376,598, Cl. 405-258.000.
Brown, Hugh B.; Noble, Stephen C.; and Markevitch, Bob V., to Ampex Corporation. Three-dimensional television system using holographic techniques. 4,376,950, Cl. 358-90.000.
Brown, R. Clark; Cotter, Richard; and Young, Susan K., to Baxter Travenol Laboratories, Inc. Biological extracts and method for making same. 4,376,819, Cl. 435-4.000.
Brown, Robert L.; and Kenney, Walter J., to United States of America, Energy. Clamp for use in winding large magnet coils. 4,376,384, Cl. 72-135.000.
Bruckner, Hans: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,376,760, Cl. 424-1.500.
Bruinshorst, Berend T. J., to U.S. Philips Corporation. Computer system with scannable program memory. 4,376,977, Cl. 364-200.000.
Brumlik, George C.: *See*—
Sundheim, Benson R.; Grady, Richard F.; and Brumlik, George C., 4,376,437, Cl. 128-82.100.
Brunnee, Curt, to Finnigan Mat GmbH. Device for preparing dissolved substances for mass-spectrometric analysis. 4,376,391, Cl. 73-863.120.
Brunswick Corporation: *See*—
Gifford, Richard L.; Hlava, Lorens G.; and Moss, Elvis W., 4,376,518, Cl. 242-84.20R.
Buelt, James L.: *See*—
Brouns, Richard A.; Buelt, James L.; and Bonner, William F., 4,376,598, Cl. 405-258.000.
Buljan, Sergej-Tomislav, to GTE Products Corporation. High density high strength Si_3N_4 ceramics prepared by pressureless sintering of amorphous Si_3N_4 powder and Ti. 4,376,652, Cl. 501-97.000.
Burchenal, Joseph H.: *See*—
Turkevich, John; and Burchenal, Joseph H., 4,376,782, Cl. 424-287.000.
Burger, Rainer; and Kleininger, Werner, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Printing plate attachment arrangement. 4,376,414, Cl. 101-415.100.
Burgess, George M., to John D. Brush & Co., Inc. Combination lock. 4,376,380, Cl. 70-303.00A.
Burke, Inc.: *See*—
Johnston, Bruce L., 4,376,317, Cl. 5-80.000.
Burroughs Corporation: *See*—
Avellanet, Frank J.; Battey, Robert L.; and Burtrem, Lloyd J., 4,376,589, Cl. 400-606.000.
Elmasry, Mohamed I.; and Peterson, LuVerne R., 4,376,986, Cl. 365-159.000.
Burtrem, Lloyd J.: *See*—
Avellanet, Frank J.; Battey, Robert L.; and Burtrem, Lloyd J., 4,376,589, Cl. 400-606.000.
B.V. Gaba: *See*—
Aardse, Henri J., 4,376,628, Cl. 433-80.000.

Byrne, John J.; Ferre, Jean M.; and Gopalakrishna, Yelandur R., to International Business Machines Corp. Low voltage serial to parallel to serial charge coupled device. 4,376,897, Cl. 377-63.000.

Caddell, Richard W.: *See*—
Ilseman, Kenneth A.; and Caddell, Richard W., 4,376,970, Cl. 364-167.000.

Calgon Corporation: *See*—
Vo, Toan P., 4,376,639, Cl. 55-26.000.
Vo, Toan P., 4,376,640, Cl. 55-26.000.

California Institute of Technology: *See*—
Yang, Lien C., 4,376,637, Cl. 55-2.000.

Campbell, Robert W.: *See*—
Nimer, Edward L.; and Campbell, Robert W., 4,376,830, Cl. 501-140.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Belinko, Keith; Patmore, David J.; Packwood, Rodney H.; and Ranganathan, Ramaswami, 4,376,695, Cl. 208-59.000.

Cannon, Dickson Y.; and Wolfe, Norman G., to Reliance Universal, Inc. Treatment of formaldehyde laden wood panels to reduce excess formaldehyde. 4,376,807, Cl. 428-528.000.

Canon Kabushiki Kaisha: *See*—
Fukuda, Tadaji; and Nakagiri, Takashi, 4,376,888, Cl. 250-211.00J.
Hara, Toshitami; Sato, Yasushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,376,945, Cl. 346-140.00R.
Ikemori, Keiji, 4,376,571, Cl. 350-467.000.
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,376,573, Cl. 351-212.000.
Someya, Hiromi; and Momiyama, Kikuo, 4,376,575, Cl. 354-155.000.

Cantrell, Steven M., to Oklahoma Basic Economy Corporation. Lubricating apparatus for pumping unit engines. 4,376,425, Cl. 123-90.380.

Carrington, James E.; and Westcott, Gerald R., to International Business Machines Corporation. Print hammer limit control. 4,376,411, Cl. 101-93.140.

Carver, George P. Convertible sailboat/motorboat. 4,376,416, Cl. 114-39.000.

Casati, Alvaro: *See*—
Horak, Edgardo; Casati, Alvaro; Bianucci, Giancarlo; Marafioti, Luigi; and Notarbartolo, Silvio, 4,376,680, Cl. 203-89.000.

Cassada, Thomas E., to International Business Machines Corporation. Multi-registration in character recognition. 4,376,932, Cl. 382-44.000.

Castaldo, Stanley C. Handbag utilizing automatically functioning illumination and alarm devices. 4,376,935, Cl. 340-571.000.

Castillo, Arturo A.: *See*—
Gardos, Michael N.; and Castillo, Arturo A., 4,376,710, Cl. 252-12.400.

Castro, Carlos A., to Texas Instruments Incorporated. Process for forming semiconductor alloys having a desired bandgap. 4,376,659, Cl. 148-1.500.

Caterpillar Tractor Co.: *See*—
Tunnell, James H.; and Piper, Hugh V., 4,376,474, Cl. 192-4.00A.

Cavallaro, Nunzio M.: *See*—
Toth, John F.; Conti, Richard J.; Cavallaro, Nunzio M.; and Dowling, Thomas B., 4,376,938, Cl. 343-700.0MS.

CBS Inc.: *See*—
Glaberson, John B., 4,376,916, Cl. 330-136.000.

Cessar, Gerald P.; and Grimshaw, Scott F., to Xerox Corporation. Method for producing semiconductor films. 4,376,688, Cl. 204-192.00S.

Censor Patent- und Versuchs-Anstalt: *See*—
Mayer, Herbert E., 4,376,581, Cl. 355-77.000.

Centro Ricerche Fiat S.p.A.: *See*—
Moretti, Luciano; and Dotti, Giulio, 4,376,453, Cl. 137-625.640.

Ceprini, Mario Q.: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,376,719, Cl. 252-426.000.

Chaffee, Edwin G., to United States of America, Army. Impedance tapered dematron. 4,376,908, Cl. 315-39.300.

Chai, An-Ti: *See*—
Evans, John C.; Chai, An-Ti; and Goradia, Chandra P., 4,376,872, Cl. 136-249.000.

Charpak, Georges; Hoan, N'Guyen N.; Policarpo, Armando; and Sauli, Fabio, to Agence Nationale de Valorisation de la Recherche (ANVAR). Detection and imaging of the spatial distribution of visible or ultraviolet photons. 4,376,892, Cl. 250-372.000.

Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., to Pitney Bowes Inc. Electronic postage metering system. 4,376,981, Cl. 364-570.000.

Chem-tronics, Inc.: *See*—
Brimm, Daniel J., 4,376,662, Cl. 148-12.300.

Chemische Fabrik Kalk GmbH: *See*—
Jenkner, Herbert; and Strang, Robert, 4,376,837, Cl. 524-108.000.

Chemische Werke Huls A.G.: *See*—
Vangermain, Erwin; and Mengler, Claus-Dieter, 4,376,718, Cl. 252-416.000.

Chemla, Dahiel; Zyss, Joseph; and Nicoud, Jean-Francois. Molecular crystal for non-linear optics. 4,376,899, Cl. 307-425.000.

Chen, Yok: *See*—
Narayan, Jagdish; and Chen, Yok, 4,376,755, Cl. 423-275.000.

Cherednichok, Vitaly T.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Kazimov, Boris I.; Zagadarchuk, Vasily F.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,376,882, Cl. 219-100.000.

Chester, Arthur W.; and Murray, James G., to Mobil Oil Corporation. Alkyltitanium and alkylchromium catalysts for olefin polymerization. 4,376,722, Cl. 252-430.000.

Cheung, Peter P. L., to Pennwalt Corporation. Method for etching dental porcelain. 4,376,673, Cl. 156-662.000.

Chevron Research Company: *See*—
Nimer, Edward L.; and Campbell, Robert W., 4,376,830, Cl. 501-140.000.
Woo, Gar L., 4,376,831, Cl. 501-140.000.

Childs, John M. Portlight for marine use. 4,376,418, Cl. 114-178.000.

Chiu, Te-Long; and Lien, Jih-Chang, to Texas Instruments Incorporated. Electrically programmable floating gate semiconductor memory device. 4,376,947, Cl. 357-23.000.

Chivers, Howard R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Digital data processing apparatus. 4,376,973, Cl. 364-200.000.

Chloride Silent Power Limited: *See*—
Bindin, Peter J., 4,376,809, Cl. 429-62.000.

Choquet, Michel F.: *See*—
Bantz, David F.; Choquet, Michel F.; and Rosenfeld, Jack L., 4,376,982, Cl. 364-900.000.

Christopfel, William C.; and Knowles, William S., to Monsanto Company. Optically active phosphine compounds. 4,376,870, Cl. 568-15.000.

Chu, Kwo R.: *See*—
Ganguly, Achintya K.; Davis, Kenneth L.; and Chu, Kwo R., 4,376,917, Cl. 331-94.100.

Chu, Muren: *See*—
Wang, Cheng-Chi; and Chu, Muren, 4,376,663, Cl. 148-171.000.

Chumley, Calvin L., to UMC Industries, Inc. Hot water valve. 4,376,447, Cl. 137-244.000.

Ciba-Geigy AG: *See*—
Breitschmid, Hans, 4,376,737, Cl. 260-509.000.
Steiger, Rolf; and Reber, Jean F., 4,376,817, Cl. 430-578.000.

Ciba-Geigy Corporation: *See*—
Rohr, Otto; and Pissiotas, Georg, 4,376,646, Cl. 71-120.000.

Circom, Inc.: *See*—
Bednarz, John J.; Moser, Phillip J.; and Rosenberg, Roger L., 4,376,350, Cl. 43-26.100.

Cirillo, John R. Portable playpen. 4,376,318, Cl. 5-99.00C.

Clarinval, Joseph A.: *See*—
Greenaway, David L.; Clarinval, Joseph A.; and Nyfeler, Alex, 4,376,887, Cl. 235-487.000.

Clark, George M. Drilling jar. 4,376,468, Cl. 175-304.000.

Clark, James T., to Parker-Hannifin Corporation. Valve spring compressor. 4,376,331, Cl. 29-219.000.

Clemens, Richard E., to Bethlehem Steel Corporation. Container for hazardous material. 4,376,489, Cl. 220-1.500.

Clementson, David D.: *See*—
Wheeler, William R.; Kren, George J.; and Clementson, David D., 4,376,482, Cl. 198-394.000.

Coca-Cola Company, The: *See*—
Sedam, Jason K.; and Fuerst, William R., 4,376,496, Cl. 222-83.500.

Codecasa, Vittorio, to E. Mottana S.p.A. Process and plant for the continuous mercerization of raw or colored open or tubular knitted fabric. 4,376,632, Cl. 8-125.000.

Coffee, Ronald A., to Imperial Chemical Industries PLC. Holder for electrostatic spraying of liquids. 4,376,514, Cl. 239-690.000.

Coffey, Theodore E., to Meat Management, Inc. Mold opening and handling apparatus. 4,376,622, Cl. 425-139.000.

Cognard, Jacques; and Phan, Trung H., to Ebauches S.A. Composition based on liquid crystal for electro-optical device. 4,376,715, Cl. 252-301.160.

Cohen, Georges, to Thomson-CSF. Antenna for primary and secondary radars. 4,376,937, Cl. 343-16.00M.

Cohen, Melvin, to Melrose Displays, Inc. Nestable basket for use with nestable shopping carts and the like. 4,376,502, Cl. 224-42.430.

Coherent, Inc.: *See*—
Mefferd, Wayne S., 4,376,328, Cl. 445-28.000.

Colbry, Norman L., to Warner Lambert Company. 2-4-Diamino-5-methyl-6-[(3,4,5-trimethoxyanilino)methyl]quinazoline salts. 4,376,858, Cl. 544-291.000.

Cole, Howard W. Mechanical muscle element. 4,376,549, Cl. 285-114.000.

Colgate-Palmolive Company: *See*—
Barth, Jordan; and Norfleet, James, 4,376,763, Cl. 424-49.000.
Hauschild, John P.; and Principe, Joseph R., 4,376,762, Cl. 424-49.000.

Collins, Gilbert C. S.: *See*—
Barltrop, John A.; Bird, Colin L.; and Collins, Gilbert C. S., 4,376,569, Cl. 350-357.000.

Collins, Johnny; and Hendrickson, Melvin C., to Zenith Radio Corporation. IR Remote control system. 4,377,006, Cl. 455-603.000.

Collinson-Jones, Rosalind I.; and Pardon, John F., to G.D. Searle & Co. Anti-sickling agents. 4,376,766, Cl. 424-177.000.

Colston, John R., to Westinghouse Electric Corp. Seawater hydraulic vane-type motor. 4,376,620, Cl. 418-79.000.

Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, to GTE Automatic Electric Labs Inc. Arbitration controller providing for access of a common resource by a plurality of central processing units. 4,376,975, Cl. 364-200.000.

Compagnie Francaise de Suceric: *See*—
Anatol, Jesus, deceased; Anatol, Marie-Francoise, legal representative; Anatol, Andre-Manuel, legal representative; Berecoechea,

Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, 4,376,783, Cl. 424-300.000.
Compagnie Generale des Etablissments Michelin: *See*—
Lejeune, Daniel, 4,376,458, Cl. 152-362.00R.
Complications S.A.: *See*—
Piaget, Valentin, 4,376,991, Cl. 368-37.000.
Compret N.V.: *See*—
Kolbel, Gert F., 4,376,533, Cl. 272-137.000.
Computervision Corporation: *See*—
Novak, W. Thomas; and Volmer, David W., 4,376,580, Cl. 355-52.000.
Cone, Richard E., to Questor Corporation. Child care seat and restraining system. 4,376,55?, Cl. 297-250.000.
Conoco Inc.: *See*—
Nield, Gerald L.; Yang, Kang; and Washecheck, Paul H., 4,376,868, Cl. 562-465.000.
Container Corporation of America: *See*—
Gardner, Jeffrey M.; and Philips, Nicholas A., 4,376,508, Cl. 229-28.00R.
Nauheimer, James F., 4,376,507, Cl. 229-15.000.
Conti, Richard J.: *See*—
Toth, John F.; Conti, Richard J.; Cavallaro, Nunzio M.; and Dowling, Thomas B., 4,376,938, Cl. 343-700.0MS.
Cook, Newell C.; and Davis, Gary C. Cyclic process for making hydrogen. 4,376,759, Cl. 423-648.00R.
Corson, Frederick P.: *See*—
Wolfe, David L.; and Corson, Frederick P., 4,376,723, Cl. 252-431.00N.
Cotter, Richard: *See*—
Brown, R. Clark; Cotter, Richard; and Young, Susan K., 4,376,819, Cl. 435-4.000.
Crounse, Nathan N., to Sterling Drug Inc. Novel monoazo and disazo colorants. 4,376,729, Cl. 260-197.000.
Crow, Robert W., to Otis Engineering Corporation. Well safety valve. 4,376,464, Cl. 166-324.000.
Cryomec, Inc.: *See*—
Duron, Paul P.; Tellez, Charles E.; and Lutjens, Robert D., 4,376,377, Cl. 62-55.500.
Cubic Western Data: *See*—
Toth, John E.; Spani, Wayne M.; Deming, Chandler R.; and Cumo, Anthony W., 4,376,942, Cl. 346-76.0PH.
Cumo, Anthony W.: *See*—
Toth, John E.; Spani, Wayne M.; Deming, Chandler R.; and Cumo, Anthony W., 4,376,942, Cl. 346-76.0PH.
Curtinot, Jean C.; Delestre, Xavier; and Fouillet, Jean, to Thomson-CSF. Ultra-high frequency tuning device of the sliding contact type. 4,376,923, Cl. 333-232.000.
Curtis, David C. Water powered sausage stuffer. 4,376,327, Cl. 17-39.000.
Cushing, Charles J.: *See*—
Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., 4,376,583, Cl. 356-237.000.
Cutler, Scott E.: *See*—
Bedard, James F.; Cutler, Scott E.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,376,969, Cl. 363-78.000.
Dahlbacka, Glen H.: *See*—
Nuckolls, John H.; Thiessen, Albert R.; and Dahlbacka, Glen H., 4,376,752, Cl. 376-152.000.
Daido Metal Company, Ltd.: *See*—
Mori, Sanae, 4,376,393, Cl. 74-579.00R.
Daigle, Donald J.: *See*—
Reinhardt, Robert M.; and Daigle, Donald J., 4,376,633, Cl. 8-184.000.
Daihatsu Motor Co., Ltd.: *See*—
Kinugasa, Haruo; Hase, Koujiros; Takeshita, Shigeru; and Mizue, Masao, 4,376,370, Cl. 60-337.000.
Daikin Manufacturing Co., Ltd.: *See*—
Kinugasa, Haruo; Hase, Koujiros; Takeshita, Shigeru; and Mizue, Masao, 4,376,370, Cl. 60-337.000.
Daiku, Nobutaka, to Nippon Electric Glass Company, Limited. Glass for use in monochromatic colored light emitting cathode ray tubes. 4,376,829, Cl. 501-64.000.
Daimler-Benz A.G.: *See*—
Bartel, Gunter; Fiedler, Horst; Stotz, Manfred; and Kleinschmit, Einhard, 4,376,492, Cl. 220-210.000.
Damico, Frank M.: *See*—
Mercier, Mark F.; and Damico, Frank M., 4,376,316, Cl. 5-66.000.
Daniel, Arnold D., Jr.: *See*—
Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., 4,376,608, Cl. 414-217.000.
Dao, Tan K.; Gold, Vance B.; Kubacki, Edward F.; and Sieverin, Walter J., to American Can Company. Monitoring weld quality via forging assembly dynamics. 4,376,883, Cl. 219-109.000.
Dart Controls, Inc.: *See*—
Penn, Paul E., 4,376,915, Cl. 324-168.000.
Data General Corporation: *See*—
Desmarais, Richard Z., 4,376,898, Cl. 307-297.000.
Davila, Joe E.: *See*—
Gomez, Jim H.; and Davila, Joe E., 4,376,442, Cl. 133-3.00C.
Davis, Charles W., to Stanadyne, Inc. Fuel injection pump with spill control mechanism. 4,376,432, Cl. 123-450.000.
Davis, Gary C.: *See*—
Cook, Newell C.; and Davis, Gary C., 4,376,759, Cl. 423-648.00R.
Davis, George B., Jr. Hand-held pneumatic caulking gun. 4,376,498, Cl. 222-326.000.
Davis, James A.; and Koch, Robert C., to Firestone Tire & Rubber Company, The. Cured rubber skim stocks having improved metal adhesion and metal adhesion retention by use of organo-metal complexes and halogenated polymer. 4,376,838, Cl. 524-184.000.
Davis, Kenneth L.: *See*—
Ganguly, Achintya K.; Davis, Kenneth L.; and Chu, Kwo R., 4,376,917, Cl. 331-94.100.
Davis, Michael G. Slide hammer having spot weldable surface engaging capability. 4,376,395, Cl. 72-479.000.
Decker, Melvin H. Multiposition switch. 4,376,877, Cl. 200-1.00B.
Dees, John R., to Fiber Industries, Inc. Melt spinning process. 4,376,743, Cl. 264-103.000.
DeForest, Marvin R.: *See*—
Stewart, John W.; Woelk, Darrell W.; and DeForest, Marvin R., 4,376,974, Cl. 364-200.000.
de Graaf, Johannes, to Akzo N.V. Preparation of p-aminoazo-benzene from aniline. 4,376,730, Cl. 260-205.000.
Degussa AG: *See*—
Drauz, Karlheinz; Kleemann, Axel; and Samson, Marc, 4,376,864, Cl. 549-373.000.
Delestre, Xavier: *See*—
Curtinot, Jean C.; Delestre, Xavier; and Fouillet, Jean, 4,376,923, Cl. 333-232.000.
Deming, Chandler R.: *See*—
Toth, John E.; Spani, Wayne M.; Deming, Chandler R.; and Cumo, Anthony W., 4,376,942, Cl. 346-76.0PH.
Desai, Natvarlal B.: *See*—
Lowicki, Norbert; and Desai, Natvarlal B., 4,376,789, Cl. 424-361.000.
DeSantis, Raymond P., to PTX-Pentronix, Inc. Mechanical and fluid actuated ram for powder compacting press and method of compacting powder material. 4,376,744, Cl. 264-106.000.
Desmarais, Richard Z., to Data General Corporation. Back bias regulator. 4,376,898, Cl. 307-297.000.
Diaz, Stephen H., to Raychem Corporation. Mass connector device. 4,376,798, Cl. 428-43.000.
Dickens, Lawrence E.; and Mountcastle, Paul H., to Westinghouse Electric Corp. Microwave coupler with high isolation and high directivity. 4,376,921, Cl. 333-116.000.
Diesel Kiki Co. Ltd.: *See*—
Hagiri, Tiichi, 4,376,476, Cl. 192-84.00R.
Nagashima, Masaru, 4,376,459, Cl. 165-96.000.
Dietrich, Bernd; and Kimpenhaus, Wolfgang, to Rheininch-Westfalisches Elektrizitatswerk Aktiengesellschaft. Heat-pump heating unit. 4,376,461, Cl. 165-170.000.
Dischert, Robert A.; Williams, James J., Jr.; and Reitmeier, Glenn A., to RCA Corporation. TDM Scheme for digital video processing. 4,376,948, Cl. 358-13.000.
Dischert, Robert A.; and Flory, Robert E., to RCA Corporation. Transmission system with sequential time-compressed baseband color. 4,376,957, Cl. 358-334.000.
Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,376,760, Cl. 424-1.500.
Dominko, Joseph S. Lounge chair convertible wheels. 4,376,547, Cl. 280-30.000.
Dorma-Baubeschlag GmbH & Co. KG: *See*—
Tillmann, Horst, 4,376,323, Cl. 16-51.000.
Dorner, Joachim: *See*—
Landgraf, Hans; Dorner, Joachim; Heinrich, Siegfried; and Horn, Manfred, 4,376,971, Cl. 364-184.000.
Dotti, Giulio: *See*—
Moretti, Luciano; and Dotti, Giulio, 4,376,453, Cl. 137-625.640.
Dow Chemical Company, The: *See*—
Bridge, William A., 4,376,621, Cl. 425-72.00R.
Lalk, James W.; Kolb, Gerald C.; Tomalia, Donald A.; and Owen, Peter W., 4,376,861, Cl. 548-237.000.
Metzger, Bruce A., 4,376,845, Cl. 525-196.000.
Nestrick, Terry J.; Peters, Thomas L.; and Lamparski, Lester L., 4,376,641, Cl. 55-67.000.
Ramirez, Enrique G., 4,376,732, Cl. 260-239.00E.
Sanner, James W., 4,376,850, Cl. 526-196.000.
Tusim, Martin H., 4,376,799, Cl. 428-213.000.
Wolfe, David L.; and Corson, Frederick P., 4,376,723, Cl. 252-431.00N.
Dowling, Thomas B.: *See*—
Toth, John F.; Conti, Richard J.; Cavallaro, Nunzio M.; and Dowling, Thomas B., 4,376,938, Cl. 343-700.0MS.
Drauz, Karlheinz; Kleemann, Axel; and Samson, Marc, to Degussa AG. Cyclic acetals of glutamic acid-γ-semialdehyde, process for their production and use. 4,376,864, Cl. 549-373.000.
Dreschmann, Peter: *See*—
Walter, Wilhelm; and Dreschmann, Peter, 4,376,541, Cl. 277-153.000.
Drexler, James V.: *See*—
Karban, Steven H.; Drexler, James V.; and Hennen, Cleon L., 4,376,874, Cl. 179-15.55T.
Duchane, David V., to United States of America, Energy. Production of super-smooth articles. 4,376,751, Cl. 264-341.000.
Duchene-Marullaz, Pierre: *See*—
Anatol, Jesus, deceased; Anatol, Marie-Francoise, legal representative; Anatol, Andre-Manuel, legal representative; Berecoechea, Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, 4,376,783, Cl. 424-300.000.
Dudley, Jack. Automatic drain clean out device. 4,376,321, Cl. 15-104.35N.

Duncan, Theodore. Hair treatment applicator. 4,376,441, Cl. 132-9.000.
Dunkl, Franz S., to Sprague Electric Company. AC Electrolytic capacitor electrolyte. 4,376,713, Cl. 252-62.200.
Dunseith, S. Michael, to Allis-Chalmers Corporation. Method and apparatus for charging a filter compartment to isolate the compartment within a baghouse installation. 4,376,638, Cl. 55-20.000.
Du Pont de Nemours, E. I., and Company: *See*—
McCartney, Robert F.; and Nazarenko, Nicholas, 4,376,869, Cl. 568-1.000.
Duron, Paul P.; Tellez, Charles E.; and Lutjens, Robert D., to Cryomec, Inc. Unloading system for cryogenic pumps. 4,376,377, Cl. 62-55.500.
Dynamit Nobel AG: *See*—
Englaender, Fritz; El-Chahawi, Moustafa; and Vogt, Wilhelm, 4,376,866, Cl. 560-60.000.
Dynatrans AB: *See*—
Bjurling, Anders, 4,376,494, Cl. 220-444.000.
E M I Limited: *See*—
Love, Douglas S., 4,376,398, Cl. 82-2.500.
E. Mottana S.p.A.: *See*—
Codecasa, Vittorio, 4,376,632, Cl. 8-125.000.
E.N.I. Ente Nazionale Idrocarburi: *See*—
Giannini, Ivo; and Baroncelli, Vittorio, 4,376,820, Cl. 435-4.000.
Eastman, Alan D.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; and Eastman, Alan D., 4,376,698, Cl. 208-215.000.
Eastman Kodak Company: *See*—
Ames, Stanley R., 4,376,790, Cl. 426-2.000.
Ames, William A., 4,376,855, Cl. 528-271.000.
Pingaud, Bernard J., 4,376,714, Cl. 252-62.560.
Eaton Corporation: *See*—
Mazur, Joseph S., 4,376,424, Cl. 123-41.120.
Eaves, Bradford W.: *See*—
White, Henry J.; and Eaves, Bradford W., 4,376,343, Cl. 34-109.000.
Ebauches S.A.: *See*—
Cognard, Jacques; and Phan, Trung H., 4,376,715, Cl. 252-301.160.
Ebeling, Edwin. Flexible dentures. 4,376,629, Cl. 433-200.000.
Eckardt, Helmut, to Battenfeld Maschinenfabrik GmbH. Injection-molding apparatus for making objects of two different resins. 4,376,625, Cl. 425-564.000.
Eckert, Alton B., Jr.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,376,981, Cl. 364-570.000.
Economics Laboratory, Inc.: *See*—
Lentsch, Steven E.; and Schmidt, William, 4,376,787, Cl. 424-315.000.
Eggers, Frederick S., to Pro Quip, Inc. Spindle assembly. 4,376,997, Cl. 369-270.000.
Egitto, Frank D.: *See*—
Wang, David N.; Egitto, Frank D.; and Maydan, Dan, 4,376,672, Cl. 156-643.000.
Egli, Ernst, to Aliva Aktiengesellschaft. Rotating material feed for apparatus for pneumatic conveying of loose materials. 4,376,600, Cl. 406-63.000.
Egyesult Izzolampa es Villamossagi Rt.: *See*—
Kerekes, Bela, 4,376,905, Cl. 313-217.000.
Ehm, Werner: *See*—
Weidinger, Hans; Ehm, Werner; and Pav, Josef, 4,376,330, Cl. 29-116.0AD.
Eichelberger, Charles W.: *See*—
Bedard, James F.; Cutler, Scott E.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,376,969, Cl. 363-78.000.
Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 2'-Phenylhydrazino-2-cyanoacrylic acid esters and herbicides containing these compounds. 4,376,645, Cl. 71-105.000.
Eidschun, Charles D., to Micro-Plate, Inc. Shielded plating cell and method. 4,376,684, Cl. 204-15.000.
Eisai Co., Ltd.: *See*—
Hirose, Noriyasu; and Souda, Shigeru, 4,376,780, Cl. 424-282.000.
El-Chahawi, Moustafa: *See*—
Englaender, Fritz; El-Chahawi, Moustafa; and Vogt, Wilhelm, 4,376,866, Cl. 560-60.000.
Elcomatic Limited: *See*—
Pettigrew, Archibald M., 4,376,958, Cl. 360-41.000.
Electric Power Research Institute: *See*—
Lucas, Robert G., 4,376,753, Cl. 376-305.000.
Electric Power Research Institute, Inc.: *See*—
Huang, Dinah C., 4,376,721, Cl. 252-430.000.
Electricite de France (Service National): *See*—
Goldman, Max; Le Fur, Daniel; and Sotton, Michel, 4,376,964, Cl. 361-233.000.
Electrolux GmbH: *See*—
Michael, Harald, 4,376,444, Cl. 137-1.000.
ELFAB Corporation: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan, 4,376,339, Cl. 29-876.000.
Eli Lilly and Company: *See*—
Booher, Richard N., 4,376,860, Cl. 546-268.000.
Elkem A/S: *See*—
Muus, Frank, 4,376,381, Cl. 70-337.000.
Elliott, Guy R. B.; Barraclough, Bruce L.; and Vanderborgh, Nicholas E., to United States of America, Energy. Substantially self-powered method and apparatus for recovering hydrocarbons from hydrocarbon-containing solid hydrates. 4,376,462, Cl. 166-267.000.
Elmasry, Mohamed I.; and Peterson, LuVerne R., to Burroughs Corporation. Double Lambda diode memory cell. 4,376,986, Cl. 365-159.000.
Emmons, William D.; and Feely, Wayne E., to Rohm and Haas Company. Hydrocurable ambient curing polyepoxide coating and adhesive compositions and method of using them. 4,376,844, Cl. 525-117.000.
Endo, Norio; and Iizuka, Hisakazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for fabricating a semiconductor device. 4,376,336, Cl. 29-571.000.
Engelbrecht, Kenneth L.: *See*—
Lahti, Archie E.; Engelbrecht, Kenneth L.; and Kalvestrand, Donald R., 4,376,976, Cl. 364-200.000.
Enggrav, Eilev: *See*—
Versteeg, Gijsbert W.; Phillips, Ian; and Enggrav, Eilev, 4,376,876, Cl. 179-77.000.
Englaender, Fritz; El-Chahawi, Moustafa; and Vogt, Wilhelm, to Dynamit Nobel AG. Process for the preparation of α-hydroxymethylene arylacetic acid. 4,376,866, Cl. 560-60.000.
English, Edgar, Jr. Solar energy conversion apparatus. 4,376,372, Cl. 60-641.150.
Engstrom, Olof; and Ovren, Christer, to Asea Aktiebolag. Fiber-optic temperature-measuring apparatus. 4,376,890, Cl. 250-227.000.
Entwistle Company, The: *See*—
Robinson, James E.; and Siwko, Eric L, 4,376,623, Cl. 425-143.000.
Enviro-Spray Systems, Inc.: *See*—
Banks, Russell; and Magid, David J., 4,376,500, Cl. 222-386.500.
Enyo, Hiroji: *See*—
Kotani, Teizo; Enyo, Hiroji; Watanabe, Masaaki; and Takemura, Yasuhiko, 4,376,846, Cl. 525-205.000.
Eriksson, Erik: *See*—
Hallqvist, Sten; and Eriksson, Erik, 4,376,407, Cl. 89-20.00R.
Eschalier, Alain: *See*—
Anatol, Jesus, deceased; Anatol, Marie-Francoise, legal representative; Anatol, Andre-Manuel, legal representative; Berecoechea, Jean; Duchene-Marullaz, Pierre; and Eschalier, Alain, 4,376,783, Cl. 424-300.000.
Esnoult, Marc; and Hugues, Jean-Claude, to Societe Europeenne des Produits Refractaires. Fused cast blocks based on refractory oxides and having a steel member embedded therein. 4,376,805, Cl. 428-409.000.
ESPE Fabrik Pharmazeutischer Praparate GmbH: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,376,835, Cl. 523-116.000.
Etablissements Eugene Scholtes: *See*—
Rossi, Alphonse; and Klammers, Gerard, 4,376,626, Cl. 431-66.000.
Eto, Shohei: *See*—
Moriwaki, Toshimoto; Hani, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, 4,376,840, Cl. 524-779.000.
"Eumig" Elektrizitas- und Metallwaren-Industrie Gesellschaft m.b.H.: *See*—
Metchev, Alexander, 4,376,990, Cl. 367-95.000.
Evans, Evan: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan, 4,376,339, Cl. 29-876.000.
Evans, John C.; Chai, An-Ti; and Goradia, Chandra P., to United States of America, National Aeronautics and Space Administration. High voltage V-groove solar cell. 4,376,872, Cl. 136-249.000.
Everett, Charles T. Cut-off saws. 4,376,356, Cl. 51-98.00R.
Exxon Research and Engineering Co.: *See*—
Johnson, Jack W.; and Jacobson, Allan J., 4,376,709, Cl. 252-1.000.
Shaub, Harold, 4,376,711, Cl. 252-32.70E.
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, to Meiji Seika Kaisha, Ltd. Antibiotic substances and processes for production thereof. 4,376,778, Cl. 424-274.000.
FAG Kugelfischer Georg Schafer & Co.: *See*—
Walter, Wilhelm; and Dreschmann, Peter, 4,376,541, Cl. 277-153.000.
Farha, Floyd E., Jr.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; and Eastman, Alan D., 4,376,698, Cl. 208-215.000.
Farrell, William J.: *See*—
Sciaky, Albert M.; Farrell, William J.; and Solomon, Julius L., 4,376,886, Cl. 219-121.0ED.
Fawcett, William R.; and Baranski, Andrzej S., to TDC Technology Development Corporation. Method for producing smooth coherent metal chalconide films. 4,376,682, Cl. 204-14.00N.
Fayfield, Robert W.; and Fontaine, Kenneth B., to Scovill Manufacturing Co. - Scovill, Inc. Valve position monitor and control system. 4,376,450, Cl. 137-554.000.
Feely, Wayne E.: *See*—
Emmons, William D.; and Feely, Wayne E., 4,376,844, Cl. 525-117.000.
Fellman, Edward: *See*—
Sette, Vincent E.; and Fellman, Edward, 4,376,544, Cl. 280-507.000.
Felt Products Mfg. Co.: *See*—
Baldacci, John W., 4,376,539, Cl. 277-1.000.
Fenske, John W.: *See*—
Simons, John R.; and Fenske, John W., 4,376,465, Cl. 169-39.000.
Ferre, Jean M.: *See*—
Byrne, John J.; Ferre, Jean M.; and Gopalakrishna, Yelandur R., 4,376,897, Cl. 377-63.000.

Ferretti, Romeo, to Pro-Sac, S.p.A. Composition for producing self-supporting stiff expanded materials. 4,376,833, Cl. 521-122.000.
Feuerherd, Karl-Heinz: *See*—
Rentzea, Costin; Feuerherd, Karl-Heinz; Zeeh, Bernd; Sauter, Hubert; and Pommer, Ernst-Heinrich, 4,376,776, Cl. 424-267.000.
Fiber Industries, Inc.: *See*—
Dees, John R., 4,376,743, Cl. 264-103.000.
Fichtel and Sachs AG: *See*—
Heyer, Gunter; Handke, Gunther; and Kopic, Joachim, 4,376,472, Cl. 188-322.220.
Fiedler, Horst: *See*—
Bartel, Gunter; Fiedler, Horst; Stotz, Manfred; and Kleinschmit, Einhard, 4,376,492, Cl. 220-210.000.
Filimonov, Boris V.: *See*—
Kudinov, Vladimir D.; and Filimonov, Boris V., 4,376,808, Cl. 428-558.000.
Finnigan Mat GmbH: *See*—
Brunnee, Curt, 4,376,391, Cl. 73-863.120.
Firestone Tire & Rubber Company, The: *See*—
Davis, James A.; and Koch, Robert C., 4,376,838, Cl. 524-184.000.
Gutierrez, Richard; and Kay, Edward L., 4,376,853, Cl. 528-1.000.
Fischer, Peter: *See*—
Schwartz, Werner; and Fischer, Peter, 4,376,649, Cl. 75-78.000.
Flory, Robert E.: *See*—
Dischert, Robert A.; and Flory, Robert E., 4,376,957, Cl. 358-334.000.
FMC Corporation: *See*—
Belk, Wilber C., 4,376,409, Cl. 99-509.000.
Fontaine, Kenneth B.: *See*—
Fayfield, Robert W.; and Fontaine, Kenneth B., 4,376,450, Cl. 137-554.000.
Food Science Institute Foundation, The: *See*—
Sato, Yasushi; and Hayakawa, Shigeru, 4,376,727, Cl. 260-112.00B.
Ford Motor Company: *See*—
Youngblood, Ralph A., 4,376,429, Cl. 123-425.000.
Formanek, Helmut: *See*—
Rauscher, Gunter; and Formanek, Helmut, 4,376,891, Cl. 250-307.000.
Formica Corporation: *See*—
West, Wilbur W., 4,376,812, Cl. 428-165.000.
Forster, Siegfried; Kleemann, Manfred; Quell, Peter; and Sack, Berthold, to Kernforschungsanlage Julich GmbH. Burner assembly with parallel passages for fuel and oxidizing gas. 4,376,627, Cl. 431-192.000.
Fouillet, Jean: *See*—
Curtinot, Jean C.; Delestre, Xavier; and Fouillet, Jean, 4,376,923, Cl. 333-232.000.
Fowler, Donald W.; and Arifian, Kenneth C., to United Technologies Corporation. Updated lock-positioning of foldable helicopter blades. 4,376,979, Cl. 364-424.000.
Foxcroft Associates: *See*—
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., 4,376,312, Cl. 3-1.700.
Fracarossi, Bruno. Inflatable boat including a mechanical propulsion assembly for operation by a user. 4,376,420, Cl. 114-345.000.
Franklin, Kenneth W., to Wentcroft Engineers Limited. Device for arranging in order a random supply of articles. 4,376,481, Cl. 198-382.000.
Franklin, Paul R., Jr. CO_2 Snow forming copper line. 4,376,511, Cl. 239-14.000.
Freeman, Alfred B. Electronic watch with sequential readout and control. 4,376,993, Cl. 368-69.000.
Freeman, John W., to Seaboard Wellhead Control, Inc. Seal assembly and valve. 4,376,526, Cl. 251-328.000.
Fremy, Raoul. Couplings for flexible conduits and the like. 4,376,525, Cl. 251-149.600.
Frimer, Aryeh. Preparation of oxacycloalkenones. 4,376,733, Cl. 549-268.000.
Fromme, Lorenz; Hendrischk, Wolfgang; and Rupp, Werner, to Mannesmann Aktiengesellschaft. Combined paper advance and ink ribbon feed system. 4,376,585, Cl. 400-185.000.
Fuerst, William R.: *See*—
Sedam, Jason K.; and Fuerst, William R., 4,376,496, Cl. 222-83.500.
Fuji Electrochemical Co., Ltd.: *See*—
Torii, Michihiro; Moritomo, Takao; Suzuki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, 4,376,961, Cl. 360-106.000.
Fujimoto, Tadao; Kawasugi, Tadaaki; Madokoro, Taketoshi; and Toriyama, Akio, to Kubota Ltd. Waste water treating apparatus. 4,376,701, Cl. 210-96.100.
Fujioka, Yasuhiro: *See*—
Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, 4,376,879, Cl. 200-314.000.
Fujisawa, Tadao, to Tokyo Electric Co., Ltd. Drive mechanism for printer carriage and ink ribbon. 4,376,586, Cl. 400-229.000.
Fujita, Fumio, to Sumitomo Chemical Co., Limited. Method for purification of cyclopentenolones. 4,376,871, Cl. 568-366.000.
Fujitsu Limited: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,376,984, Cl. 365-104.000.
Hataishi, Osamu; and Momma, Yoshinobu, 4,376,664, Cl. 148-175.000.
Isogai, Hideaki, 4,376,985, Cl. 365-155.000.
Takemae, Yoshihiro, 4,376,989, Cl. 365-230.000.
Fukada, Yasuo: *See*—
Ohtawa, Kimiaki; Tokuda, Masahiro; and Fukada, Yasuo, 4,376,648, Cl. 75-35.000.
Fukami, Akira: *See*—
Moriwaki, Toshimoto; Hasi, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, 4,376,840, Cl. 524-779.000.
Fukuda, Tadaji; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Photoelectric conversion type information processing device. 4,376,888, Cl. 250-211.00J.
Fukushi, Kouji: *See*—
Kobayasi, Tomio; and Fukushi, Kouji, 4,376,337, Cl. 29-603.000.
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, to Fujitsu Limited. Programmable read-only memory device. 4,376,984, Cl. 365-104.000.
Furuhashi, Kenshi: *See*—
Iwata, Masayosi; Furuhashi, Kenshi; and Yokoyama, Tadashi, 4,376,878, Cl. 200-61.270.
Furukawa, Hideo; Okamoto, Masaaki; and Shinbori, Kazuyoshi, to Kabushiki Kaisha Komatsu Seisakusho. Method of mounting a timing gear on a crankshaft. 4,376,335, Cl. 29-447.000.
G.D. Searle & Co.: *See*—
Collinson-Jones, Rosalind I.; and Pardon, John F., 4,376,766, Cl. 424-177.000.
G.D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,376,484, Cl. 209-535.000.
Gall, John C., to Sears, Roebuck and Co. Lockable closure for containers. 4,376,493, Cl. 220-307.000.
Gall, Rudi: *See*—
Bosies, Elmar; Heerdt, Ruth; Gall, Rudi; Bicker, Uwe; and Ziegler, Anna E., 4,376,731, Cl. 260-239.00E.
Gambro Dialysatoren G.m.b.H. & Co. K.G.: *See*—
Lehmann, Hans-Dieter, 4,376,707, Cl. 210-679.000.
Ganguly, Achintya K.; Davis, Kenneth L.; and Chu, Kwo R., to United States of America, Navy. Solid-state cyclotron maser. 4,376,917, Cl. 331-94.100.
Gardner, Jeffrey M.; and Philips, Nicholas A., to Container Corporation of America. Container with integral partition. 4,376,508, Cl. 229-28.00R.
Gardner, Lloyd E.; Farha, Floyd E., Jr.; and Eastman, Alan D., to Phillips Petroleum Company. Catalytic hydrodesulfurization of organic compounds employing promoted zinc titanate. 4,376,698, Cl. 208-215.000.
Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic hydrocracking, hydrodesulfurization, and/or hydrodesnitrogenation of organic compounds employing promoted zinc titanate and a zeolite as the catalytic agent. 4,376,699, Cl. 208-215.000.
Gardner, Thomas H.: *See*—
Whitehead, Gareth D. J.; and Gardner, Thomas H., 4,376,422, Cl. 119-1.000.
Gardos, Michael N.; and Castillo, Arturo A., to Hughes Aircraft Company. High load carrying polyimide lubricative composites. 4,376,710, Cl. 252-12.400.
Garza, Robert L., to Schuster, James. Temporary fan belt replacement for emergency purposes on motor vehicles. 4,376,631, Cl. 474-255.000.
Gasser, Oswald: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,376,835, Cl. 523-116.000.
Gavioli, Gabriele. Thermally insulating wall structure particularly for kilns. 4,376,342, Cl. 34-86.000.
Gazzarrini, Vinicio, to Solis s.r.l. Improvements in a machine for applying a gusset to tubular articles such as women's pantyhose. 4,376,400, Cl. 83-109.000.
Gebr. Bode & Co.: *See*—
Landgraf, Hans; Dorner, Joachim; Heinrich, Siegfried; and Horn, Manfred, 4,376,971, Cl. 364-184.000.
General Electric Company: *See*—
Bedard, James F.; Cutler, Scott E.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,376,969, Cl. 363-78.000.
Horrigan, Raymond J., deceased, 4,376,904, Cl. 310-208.000.
Jernakoff, George, 4,376,912, Cl. 315-248.000.
Shah, Rameschandra V., 4,376,485, Cl. 209-575.000.
Whetten, Nathan R., 4,376,893, Cl. 250-374.000.
General Motors Corporation: *See*—
Margrave, Shawn G.; and Nordeen, Donald L., 4,376,563, Cl. 339-91.00R.
General Railway Signal Company: *See*—
Gomez, Jim H.; and Davila, Joe E., 4,376,442, Cl. 133-3.00C.
Genovese, Anthony: *See*—
Ward, John; Austin, Robert; and Genovese, Anthony, 4,376,746, Cl. 264-167.000.
George, Clifford L.; and Smith, Wayne R., to Xerox Corporation. Finishing station for reproducing machine. 4,376,529, Cl. 270-53.000.
Gerber, Donald J., to Koppers Company, Inc. Coke oven heating wall. 4,376,677, Cl. 202-267.00A.
Gewerkschaft Eisenhatte Westfalia: *See*—
Breuer, Oswald; and Merten, Gerhard, 4,376,553, Cl. 299-34.000.
Giannini, Ivo; and Baroncelli, Vittorio, to E.N.I. Ente Nazionale Idrocarburi. Composition suitable for testing biological tissues and/or liquids, and the method of use. 4,376,820, Cl. 435-4.000.
Gibson, David W. Bale handling apparatus. 4,376,607, Cl. 414-24.600.
Gifford, Richard L.; Hlava, Lorens G.; and Moss, Elvis W., to Brunswick Corporation. Snap-in anti reverse selector. 4,376,518, Cl. 242-84.20R.

Gijzen, Wilhelmus A. H., to U.S. Philips Corporation. Pivoting mirror device. 4,376,572, Cl. 350-486.000.

Gill, Carl L. In-line separator for crude oil. 4,376,676, Cl. 196-46.000.

Ginter, Tom, Jr.; and Hunt, Harold E. Apparatus for and method of making V-belts. 4,376,668, Cl. 156-92.000.

Glaberson, John B., to CBS Inc. Signal compression and expansion system. 4,376,916, Cl. 330-136.000.

Goebel, Franz, to GTE Products Corporation. Electrochemical cell. 4,376,811, Cl. 429-101.000.

Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, to American Can Company. Closed loop control of continuous seam resistance heated forge welding cylinders. 4,376,884, Cl. 219-109.000.

Gold, Vance B.: *See*—
Dao, Tan K.; Gold, Vance B.; Kubacki, Edward F.; and Sieverin, Walter J., 4,376,883, Cl. 219-109.000.

Goldman, Jon C.: *See*—
Arrasmith, Robert D.; Barnhart, Thomas R.; and Goldman, Jon C., 4,376,796, Cl. 427-82.000.

Goldman, Max; Le Fur, Daniel; and Sotton, Michel, to Electricite de France (Service National). Electrical treatment of textile yarn or fibers. 4,376,964, Cl. 361-233.000.

Goldwasser, David J.; and Onder, Kemal, to Upjohn Company, The. Polyurethane prepared by reaction of an organic polyisocyanate, a chain extender and an isocyanate-reactive material of m.w. 500-20,000 characterized by the use of only 2-25 percent by weight of the latter material. 4,376,834, Cl. 521-159.000.

Gomez, Jim H.; and Davila, Joe E., to General Railway Signal Company. Coin Assorter. 4,376,442, Cl. 133-3.00C.

Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, to Tenneco Chemicals, Inc. Process for the production of aqueous dispersions of solid free radical-generating initiators. 4,376,719, Cl. 252-426.000.

Gopalakrishna, Yelandur R.: *See*—
Byrne, John J.; Ferre, Jean M.; and Gopalakrishna, Yelandur R., 4,376,897, Cl. 377-63.000.

Goradia, Chandra P.: *See*—
Evans, John C.; Chai, An-Ti; and Goradia, Chandra P., 4,376,872, Cl. 136-249.000.

Gotanda, Motohiro. Locking device. 4,376,379, Cl. 70-118.000.

Goyen, Albert H. Header and valving assembly. 4,376,523, Cl. 251-61.100.

Grady, Richard F.: *See*—
Sundheim, Benson R.; Grady, Richard F.; and Brumlik, George C., 4,376,437, Cl. 128-82.100.

Grass, Alfred. Drawer support and/or guide roller with axial bearing pin. 4,376,555, Cl. 308-3.800.

Great Neck Saw Manufacturers, Inc.: *See*—
Jacoff, Daniel, 4,376,456, Cl. 145-33.00A.

Green, M. L. Portable roadway. 4,376,596, Cl. 404-35.000.

Green, Talmage O., to Precision Instruments, Inc. Torque wrench testing devices and the like. 4,376,386, Cl. 73-1.00C.

Greenaway, David L.; Clarinval, Joseph A.; and Nyfeler, Alex, to LGZ Landis & Gyr Zug AG. Device for the thermal erasure of mechanically readable optical markings. 4,376,887, Cl. 235-487.000.

Gregory, Harold D., to Gregory, Virginia M. Cryogenic device operable in single or dual phase with a range of nozzle sizes and method of using the same. 4,376,376, Cl. 62-51.000.

Gregory, Virginia M.: *See*—
Gregory, Harold D., 4,376,376, Cl. 62-51.000.

Grelecki, Chester J.: *See*—
Marcellis, Alphonso W.; and Grelecki, Chester J., 4,376,665, Cl. 149-22.000.

Gries, Josef: *See*—
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.

Grillo-Werke AG: *See*—
Lowicki, Norbert; and Desai, Natvarlal B., 4,376,789, Cl. 424-361.000.

Grimshaw, Scott F.: *See*—
Ceasar, Gerald P.; and Grimshaw, Scott F., 4,376,688, Cl. 204-192.00S.

Gross, Josef; Barkow, William H.; and Mirsch, John W., to RCA Corporation. Self-converging television display system. 4,376,924, Cl. 335-210.000.

Grube, Herbert E.: *See*—
Whitehead, Howard A.; Roeder, Robert J.; and Grube, Herbert E., 4,376,440, Cl. 604-387.000.

Grunau Company Co.: *See*—
Simons, John R.; and Fenske, John W., 4,376,465, Cl. 169-39.000.

GTE Automatic Electric Labs Inc.: *See*—
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,376,975, Cl. 364-200.000.

GTE Products Corporation: *See*—
Buljan, Sergej-Tomislav, 4,376,652, Cl. 501-97.000.
Goebel, Franz, 4,376,811, Cl. 429-101.000.
Hough, Harold L., 4,376,967, Cl. 362-306.000.

Guccione, Leo A.; and Millar, David, to Long, Timothy. Vehicle front end shield. 4,376,546, Cl. 280-770.000.

Guenther, Carl D. Easy-on tire chains. 4,376,457, Cl. 152-213.00R.

Gunschmann, Peter; and Wolf, Theo, to Robert Bosch GmbH. Automatic threading magnetic tape recording apparatus, particularly video tape recorder. 4,376,962, Cl. 360-130.320.

Gutierrez, Richard; and Kay, Edward L., to Firestone Tire & Rubber Company, The. Processing of guayule material by volatilizing and heating steps. 4,376,853, Cl. 528-1.000.

Haddad, Albert G., to Agricultural Aviation Engineering Co. Apparatus for translating sound into a visual display. 4,376,404, Cl. 84-464.00R.

Haedrich, Walter; and Lawson, J. Dennis, to Haedrich, Walter. Flute. 4,376,403, Cl. 84-384.000.

Haentjens, Yan: *See*—
Marchand, Maurice; and Haentjens, Yan, 4,377,005, Cl. 455-327.000.

Hafner, Alfred; and Muschner, Udo, to Stopinc Aktiengesellschaft. Closure element and assembly of a slide closure for use in liquid melt containers. 4,376,501, Cl. 222-600.000.

Hagar, Jay L., to Toro Company, The. Irrigation stream splitter. 4,376,513, Cl. 239-231.000.

Hagemann, Hermann: *See*—
Kuhle, Engelbert; and Hagemann, Hermann, 4,376,735, Cl. 260-453.0RW.

Hagiri, Tiichi, to Diesel Kiki Co. Ltd. Driving circuit for magnetic clutches for use with refrigerant compressors. 4,376,476, Cl. 192-84.00R.

Hahn, Edward R., to Albany International Corp. Eight harness paper-making fabric. 4,376,455, Cl. 139-383.00A.

Hallqvist, Sten; and Eriksson, Erik, to Aktiebolaget Bofors. Device for breech ring. 4,376,407, Cl. 89-20.00R.

Hamjern A/S: *See*—
Noroy, Terje, 4,376,326, Cl. 17-21.000.

Hammann, Ingeborg: *See*—
Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,376,786, Cl. 424-304.000.

Hampel, Wilbur J.; and Lonn, Dana R., to Toro Company, The. Drive coupling. 4,376,630, Cl. 464-88.000.

Handke, Gunther: *See*—
Heyer, Gunter; Handke, Gunther; and Kopic, Joachim, 4,376,472, Cl. 188-322.220.

Hang, Kenneth W.: *See*—
Prabhu, Ashok N.; and Hang, Kenneth W., 4,376,725, Cl. 252-512.000.

Hani, Kiyoshi: *See*—
Moriwaki, Toshimoto; Hani, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, 4,376,840, Cl. 524-779.000.

Hannah, John, to Merck & Co., Inc. Antibiotic N-heterocyclyl thienamycin. 4,376,774, Cl. 424-263.000.

Hanover, Laren M.: *See*—
Holbrook, James L.; and Hanover, Laren M., 4,376,791, Cl. 426-565.000.

Hanson, Newell B., to Hanson Silo Company. Access door assembly for a silo. 4,376,360, Cl. 52-193.000.

Hanson Silo Company: *See*—
Hanson, Newell B., 4,376,360, Cl. 52-193.000.

Hara, Hidetada, to Takashima & Co., Ltd. Fire extinguishing apparatus for airdropping a fire-extinguishing agent. 4,376,466, Cl. 169-53.000.

Hara, Toshitami; Sato, Yasushi; Takatori, Yasushi; and Shirato, Yoshiaki, to Canon Kabushiki Kaisha. Ink jet recording device. 4,376,945, Cl. 346-140.00R.

Harada, Hidefumi: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, 4,376,656, Cl. 106-309.000.

Hardee's Food Systems, Inc.: *See*—
Stahl, Lawrence E., 4,376,434, Cl. 126-299.00D.

Harney, Donald W. G.; Lehman, Peter G.; and Rundle, Joseph C., to ICI Australia Limited. Pesticidal fluorinated esters of the pyrethrin or pyrethroid type. 4,376,784, Cl. 424-304.000.

Harnischfeger Corp. of Canada Ltd.: *See*—
Van Soest, Cornelius J. M.; Muller, Rostislav; and Bagaric, Stjepan, 4,376,487, Cl. 212-147.000.

Hart, Robert J.; and Joseph, Ralph C., to Bell Telephone Laboratories, Inc. Pattern printing including aligning masks and monitoring such alignment. 4,376,584, Cl. 356-401.000.

Hase, Koujirou: *See*—
Kinugasa, Haruo; Hase, Koujirou; Takeshita, Shigeru; and Mizue, Masao, 4,376,370, Cl. 60-337.000.

Hata, Yoshitaka; and Shioyama, Giichi, to Nissan Motor Company, Limited. Spark timing control system for internal combustion engine. 4,376,428, Cl. 123-417.000.

Hataishi, Osamu; and Momma, Yoshinobu, to Fujitsu Limited. Method of producing a semiconductor device. 4,376,664, Cl. 148-175.000.

Hattori, Masaichi: *See*—
Takeda, Nobuhiro; Mizuno, Shigeo; Takaishi, Yukio; and Hattori, Masaichi, 4,376,896, Cl. 307-115.000.

Hauschild, John P.; and Principe, Joseph R., to Colgate-Palmolive Company. Functional agglomerated speckles, dentifrices containing such speckles and methods for manufacturing such speckles and dentifrices containing them. 4,376,762, Cl. 424-49.000.

Hausermann Abrading Process Company: *See*—
Hausermann, Marten C., 4,376,355, Cl. 51-58.000.

Hausermann, Marten C., to Hausermann Abrading Process Company. Abrading apparatus having zero reference sensing means. 4,376,355, Cl. 51-58.000.

Haushalter, Frederick W.; and Lord, Thomas J., to United Aircraft Products, Inc. Accumulator-reservoir device diaphragm control. 4,376,619, Cl. 417-540.000.

Havelka, Otakar: *See*—
Lanik, Igor; Havelka, Otakar; and Pirochta, Dusan, 4,376,651, Cl. 106-38.240.

Hayakawa, Shigeru: *See*—
Sato, Yasushi; and Hayakawa, Shigeru, 4,376,727, Cl. 260-112.00B.
Hayashi, Yoshio; Onuma, Akira; and Shiga, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for storing sheets of photothermographic sheet material. 4,376,816, Cl. 430-347.000.
Hayhoe, Michael. Retaining and braking apparatus for use with powered rotational force applicator tool. 4,376,396, Cl. 81-57.140.
Heerdt, Ruth: *See*—
Bosies, Elmar; Heerdt, Ruth; Gall, Rudi; Bicker, Uwe; and Ziegler, Anna E., 4,376,731, Cl. 260-239.00E.
Heidelberger Druckmaschinen AG: *See*—
Breunig, Anton, 4,376,531, Cl. 271-202.000.
Heilskov, Jens A., to Sidewinder International, Ltd. Marine fender. 4,376,419, Cl. 114-219.000.
Heinen, Manfred: *See*—
Kotzar, Joachim; and Heinen, Manfred, 4,376,540, Cl. 277-3.000.
Heinrich, Siegfried: *See*—
Landgraf, Hans; Dorner, Joachim; Heinrich, Siegfried; and Horn, Manfred, 4,376,971, Cl. 364-184.000.
Heitmann, Juergen: *See*—
Ludwig, Volker; and Heitmann, Juergen, 4,376,988, Cl. 365-222.000.
Helfman, Charles. Building structure. 4,376,353, Cl. 49-504.000.
Hellwig, Hubertus; Schuster, Hans-Joachim; and Heppner, Klaus-Dieter, to Siemens Aktiengesellschaft. Method and device for the partial galvanization of surfaces which are conducting or have been made conducting. 4,376,683, Cl. 204-15.000.
Helpinstill, Charles T., II. Folding piano. 4,376,402, Cl. 84-176.000.
Hemmelgarn, Donald J.: *See*—
Bergman, Raymond A.; and Hemmelgarn, Donald J., 4,376,556, Cl. 308-6.00C.
Hendrickson, Melvin C.: *See*—
Collins, Johnny; and Hendrickson, Melvin C., 4,377,006, Cl. 455-603.000.
Hendrischk, Wolfgang: *See*—
Fromme, Lorenz; Hendrischk, Wolfgang; and Rupp, Werner, 4,376,585, Cl. 400-185.000.
Hennen, Cleon L.: *See*—
Karban, Steven H.; Drexler, James V.; and Hennen, Cleon L., 4,376,874, Cl. 179-15.55T.
Hennessy, James J., to Hennessy Products, Incorporated. Hopper door gasket structure. 4,376,542, Cl. 277-189.000.
Hennessy Products, Incorporated: *See*—
Hennessy, James J., 4,376,542, Cl. 277-189.000.
Henrichson, Olle: *See*—
Soininen, Pentti; and Henrichson, Olle, 4,376,352, Cl. 49-68.000.
Heppner, Klaus-Dieter: *See*—
Hellwig, Hubertus; Schuster, Hans-Joachim; and Heppner, Klaus-Dieter, 4,376,683, Cl. 204-15.000.
Hesse, Peter: *See*—
Lohr, Bernhard; Hesse, Peter; and Schuster, Robert, 4,376,694, Cl. 208-48.00R.
Heyer, Gunter; Handke, Gunther; and Kopic, Joachim, to Fichtel and Sachs AG. Cylinder piston device. 4,376,472, Cl. 188-322.220.
Higby, Bernard I., to Horix Manufacturing Co. Method and apparatus for synchronously driving AC synchronous motors. 4,376,913, Cl. 318-85.000.
Himmelbauer, Erich E., to U.S. Philips Corporation. Television camera tube with diode electron gun. 4,376,907, Cl. 313-389.000.
Hinnenkamp, James A.; and Walatka, Vernon V., Jr., to National Distillers & Chemical Corp. Synthetic crystalline silicate compositions and preparation thereof. 4,376,757, Cl. 423-332.000.
Hirano, Masachika: *See*—
Matsuo, Noritada; and Hirano, Masachika, 4,376,785, Cl. 424-304.000.
Hirano, Reiji: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,376,573, Cl. 351-212.000.
Hirata, Takeo: *See*—
Kawamatsu, Yutaka; Sohda, Takashi; and Hirata, Takeo, 4,376,777, Cl. 424-270.000.
Hirose, Noriyasu; and Souda, Shigeru, to Eisai Co., Ltd. Novel phenethylamine derivatives and bronchdilator containing the same. 4,376,780, Cl. 424-282.000.
Hitachi, Ltd.: *See*—
Inoue, Tomoaki; Okano, Kinpei; Ikeuchi, Kazuo; and Koga, Tsuguaki, 4,376,389, Cl. 73-118.000.
Kanamaru, Hisanobu; Okabe, Moisei; Tohkairin, Akira; and Tatsumi, Hideo, 4,376,333, Cl. 29-432.000.
Hlava, Lorens G.: *See*—
Gifford, Richard L.; Hlava, Lorens G.; and Moss, Elvis W., 4,376,518, Cl. 242-84.20R.
Hoan, N'Guyen N.: *See*—
Charpak, Georges; Hoan, N'Guyen N.; Policarpo, Armando; and Sauli, Fabio, 4,376,892, Cl. 250-372.000.
Hoashi, Kenzo: *See*—
Kojima, Yasuo; Morita, Koichi; Hoashi, Kenzo; and Aruga, Taketo, 4,376,371, Cl. 60-420.000.
Hoch, Samuel: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,376,719, Cl. 252-426.000.
Hochwitz, Lynn E., to Allis-Chalmers Corporation. Flexible seal for a pivot joint in a snow thrower chute. 4,376,345, Cl. 37-260.000.
Hodogaya Chemical Co., Ltd.: *See*—
Yamaguchi, Toyohiko; Kashima, Koichi; and Kaifu, Nobuo, 4,376,854, Cl. 528-137.000.
Hoechst Aktiengesellschaft: *See*—
Wiezer, Hartmut; and Pfahler, Gerhard, 4,376,836, Cl. 524-100.000.
Hoffman, Brent K. Tool for use in adjusting engine valves. 4,376,395, Cl. 81-3.00R.
Hofmann, Hans P.: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; and Teschendorf, Hans-Juergen, 4,376,773, Cl. 424-251.000.
Hogan, John P.; and Banks, Robert L., to Phillips Petroleum Company. Solid polymers of olefins and production of such polymers. 4,376,851, Cl. 526-351.000.
Hohulin, Samuel E.: *See*—
Lockhart, Scott N.; Hohulin, Samuel E.; and Brooks, Joseph F., deceased, 4,376,322, Cl. 15-323.000.
Holbrook, James L.; and Hanover, Laren M., to A. E. Staley Manufacturing Company. Fructose-containing frozen dessert products. 4,376,791, Cl. 426-565.000.
Homeyer, Bernhard: *See*—
Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,376,786, Cl. 424-304.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Tagami, Katsutoshi; and Tuchiya, Yoshikazu, 4,376,909, Cl. 313-82.000.
Honeywell Information Systems Inc.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana W., 4,376,972, Cl. 364-200.000.
Horak, Edgardo; Casati, Alvaro; Bianucci, Giancarlo; Marafioti, Luigi; and Notarbartolo, Silvio, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for demonomerizing polycaprossamide. 4,376,680, Cl. 203-89.000.
Horikoshi, Masafumi; Sato, Michikatsu; and Onishi, Takanori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling primary and secondary air/fuel ratios for internal combustion engine. 4,376,369, Cl. 60-276.000.
Horino, Shigeo; Taniguchi, Shoji; and Omura, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet-like material sorting apparatus. 4,376,364, Cl. 53-54.000.
Horix Manufacturing Co.: *See*—
Higby, Bernard I., 4,376,913, Cl. 318-85.000.
Horn, Manfred: *See*—
Landgraf, Hans; Dorner, Joachim; Heinrich, Siegfried; and Horn, Manfred, 4,376,971, Cl. 364-184.000.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,376,712, Cl. 252-49.600.
Horrigan, Doris C., executrix: *See*—
Horrigan, Raymond J., deceased, 4,376,904, Cl. 310-208.000.
Horrigan, Raymond J., deceased (by Horrigan, Doris C., executrix), to General Electric Company. Insulated electromagnetic coil. 4,376,904, Cl. 310-208.000.
Hoshi, Tsutomu: *See*—
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tsutomu, 4,376,740, Cl. 264-10.000.
Hosler, Klaus: *See*—
Tax, Hans; and Hosler, Klaus, 4,376,452, Cl. 137-615.000.
Hough, Harold L., to GTE Products Corporation. Front loading projection unit with wireform retention member. 4,376,967, Cl. 362-306.000.
Howse, Clifford G., to Al-Hajry, Mohammed N. Pretreating inorganic surfaces with ammonium salt of thioglycolic acid. 4,376,797, Cl. 427-302.000.
Hsia, Yukun, to McDonnell Douglas Corporation. Threshold referenced MNOS sense amplifier. 4,376,987, Cl. 365-184.000.
Huang, Dinah C., to Electric Power Research Institute, Inc. Methanol synthesis catalyst and method for its preparation. 4,376,721, Cl. 252-430.000.
Huddleston, Bruce C.: *See*—
Weber, Roy; and Huddleston, Bruce C., 4,376,373, Cl. 60-648.000.
Hudgins, Herbert E., to A. B. Carter, Inc. Deburring machines for shop and screw machine parts. 4,376,603, Cl. 409-140.000.
Huff, Joel R.: *See*—
Saari, Walfred S.; and Huff, Joel R., 4,376,772, Cl. 424-250.000.
Hughes Aircraft Company: *See*—
Gardos, Michael N.; and Castillo, Arturo A., 4,376,710, Cl. 252-12.400.
Hugues, Jean-Claude: *See*—
Esnoult, Marc; and Hugues, Jean-Claude, 4,376,805, Cl. 428-409.000.
Hummert, George T.; and McNab, Ian R., to Westinghouse Electric Corp. Electromagnetic pump. 4,376,615, Cl. 417-50.000.
Hunstad, Vernon D. Exerciser for muscles used in skiing. 4,376,532, Cl. 272-97.000.
Hunt, Harold E.: *See*—
Ginter, Tom, Jr.; and Hunt, Harold E., 4,376,668, Cl. 156-92.000.
Hunt, James D.: *See*—
Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., 4,376,583, Cl. 356-237.000.
Hurst, Louis S.; and Lloyd, Norman E., to Nabisco Brands, Inc. Process for producing glucose/fructose syrups from unrefined starch hydrolysates. 4,376,824, Cl. 435-94.000.
Huynh, Cu S.: *See*—
Pratt, John D.; and Huynh, Cu S., 4,376,604, Cl. 411-34.000.
Hyde Products, Inc.: *See*—
Blonski, Paul, 4,376,417, Cl. 114-106.000.

ICI Australia Limited: *See*—
Harney, Donald W. G.; Lehman, Peter G.; and Rundle, Joseph C., 4,376,784, Cl. 424-304.000.
Igarashi, Kenji: *See*—
Toyoda, Akira; Arima, Shizuo; Nozawa, Katsumi; and Igarashi, Kenji, 4,376,618, Cl. 417-417.000.
Iida, Katsuyoshi: *See*—
Yokooku, Katsuhiko; and Iida, Katsuyoshi, 4,376,431, Cl. 123-440.000.
Iijima, Takashi: *See*—
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,376,689, Cl. 204-195.00B.
Iijima, Tetsuya; and Yano, Hiroshi, to Nissan Motor Company, Limited. Air circulation system in a vehicle compartment of an automotive vehicle. 4,376,408, Cl. 98-2.030.
Iizuka, Haruhiko; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Split type internal combustion engine. 4,376,426, Cl. 123-198.00F.
Iizuka, Hisakazu: *See*—
Endo, Norio; and Iizuka, Hisakazu, 4,376,336, Cl. 29-571.000.
Ikeda, Akihiko: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, 4,376,687, Cl. 204-181.00C.
Ikegami, Tadashi: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,376,720, Cl. 252-430.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Photographic small size objective. 4,376,571, Cl. 350-467.000.
Ikeuchi, Kazuo: *See*—
Inoue, Tomoaki; Okano, Kinpei; Ikeuchi, Kazuo; and Koga, Tsuguaki, 4,376,389, Cl. 73-118.000.
ILC Technology, Inc.: *See*—
Szilagyi, Imre; and Alexander, Steven, 4,376,906, Cl. 313-332.000.
Illinois Tool Works Inc.: *See*—
Miller, Richard G., 4,376,334, Cl. 29-437.000.
Peterson, Francis C., 4,376,606, Cl. 411-155.000.
Ilseman, Kenneth A.; and Caddell, Richard W., to Kearney & Trecker Corporation. High speed digital position monitoring system. 4,376,970, Cl. 364-167.000.
Imperial Chemical Industries PLC: *See*—
Coffee, Ronald A., 4,376,514, Cl. 239-690.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,376,880, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for detecting gap conditions in EDM process with monitoring pulses. 4,376,880, Cl. 219-69.00M.
Inoue, Tomoaki; Okano, Kinpei; Ikeuchi, Kazuo; and Koga, Tsuguaki, to Hitachi, Ltd. Method of diagnosis of operating conditions of bearing and apparatus therefor. 4,376,389, Cl. 73-118.000.
Inoue, Tomoaki; Ishikawa, Yoichi; and Kaneko, Mitsunori, to Oriental Yeast Co., Ltd. Method of measuring carbon dioxide in a liquid or gas. 4,376,681, Cl. 204-1.00T.
Inoue, Yoshihiro: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, 4,376,656, Cl. 106-309.000.
Inouye, Shigeharu: *See*—
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, 4,376,778, Cl. 424-274.000.
Institut International de Pathologie Cellulaire et Moleculaire: *See*—
Trouet, Andre B. L.; Masquelier, Michele M. L. G.; and Baurain, Roger M., 4,376,765, Cl. 424-177.000.
Instone, John C., Jr., to SGL Industries, Inc. Duplex grounding. 4,376,559, Cl. 339-14.00R.
International Business Machines Corporation: *See*—
Bahr, Dietrich J.; and Briska, Marian, 4,376,943, Cl. 346-135.100.
Bantz, David F.; Choquet, Michel F.; and Rosenfeld, Jack L., 4,376,982, Cl. 364-900.000.
Barltrop, John A.; Bird, Colin L.; and Collins, Gilbert C. S., 4,376,569, Cl. 350-357.000.
Byrne, John J.; Ferre, Jean M.; and Gopalakrishna, Yelandur R., 4,376,897, Cl. 377-63.000.
Carrington, James E.; and Westcott, Gerald R., 4,376,411, Cl. 101-93.140.
Cassada, Thomas E., 4,376,932, Cl. 382-44.000.
Karol, Kenneth N., 4,376,960, Cl. 360-99.000.
Knoop, Jack P.; Weiss, Joel R.; and Uy, James C., 4,376,963, Cl. 360-135.000.
Moeller, Dennis L., 4,376,588, Cl. 400-322.000.
Rex, Donald K., 4,376,587, Cl. 400-247.000.
International Harvester Co.: *See*—
Schumacher, William G., 4,376,554, Cl. 301-63.0DD.
Tomasek, Donald J.; and McCash, Benjamin L., 4,376,473, Cl. 192-3.580.
Intrater, Josef; and Bertoldo, Gene, to Advanced Technology, Inc. Highly adhesive coatings for beryllia. 4,376,806, Cl. 428-469.000.
Inverni Della Beffa S.p.A.: *See*—
Lietti, Andrea; and Bonati, Attilio, 4,376,781, Cl. 424-283.000.
Irons, Stanton D., to Bethlehem Steel Corporation. Method for beneficiating coal ore. 4,376,700, Cl. 209-17.000.
Ishida, Toshihiko; Azegami, Hitoshi; and Kawakami, Yoshio, to TDK Electronics Co., Ltd. Lubricant sheet for magnetic tape cassette. 4,376,519, Cl. 242-199.000.
Ishida, Yuzuru: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Ishida, Yuzuru; and Iwamoto, Mune, 4,376,847, Cl. 525-262.000.
Ishigaki, Isao: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.
Ishikawa, Tadashi: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,376,994, Cl. 368-74.000.
Ishikawa, Yasuyuki: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,376,573, Cl. 351-212.000.
Ishikawa, Yoichi: *See*—
Inoue, Tomoaki; Ishikawa, Yoichi; and Kaneko, Mitsunori, 4,376,681, Cl. 204-1.00T.
Isogai, Hideaki, to Fujitsu Limited. Semiconductor memory device. 4,376,985, Cl. 365-155.000.
Ito, Norifumi: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Ishida, Yuzuru; and Iwamoto, Mune, 4,376,847, Cl. 525-262.000.
Ito, Tatsuo: *See*—
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, 4,376,778, Cl. 424-274.000.
Itoh, Norifumi: *See*—
Torii, Michihiro; Moritomo, Takao; Suzuki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, 4,376,961, Cl. 360-106.000.
ITT: *See*—
Muzslay, Steven Z., 4,376,922, Cl. 333-182.000.
ITT Industries, Inc.: *See*—
Prohaska, Hans; and Rachner, Horst, 4,376,934, Cl. 340-815.170.
Iwamoto, Mune: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Ishida, Yuzuru; and Iwamoto, Mune, 4,376,847, Cl. 525-262.000.
Iwans, Robert C., to Kidde, Inc. Vehicular toilet. 4,376,314, Cl. 4-431.000.
Iwaosa, Katsuaki: *See*—
Ohashi, Minoru; and Iwaosa, Katsuaki, 4,376,818, Cl. 430-623.000.
Iwata, Masayosi; Furuhashi, Kenshi; and Yokoyama, Tadashi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switch assembly for use in vehicle. 4,376,878, Cl. 200-61.270.
Iwata, Yasuhiro: *See*—
Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, 4,376,879, Cl. 200-314.000.
Izumo, Terutsugu: *See*—
Komatu, Satoru; Kobane, Sumio; Yamamoto, Masanobu; Takahashi, Hiroshi; and Izumo, Terutsugu, 4,376,931, Cl. 340-58.000.
Jackson, Hewy E., to Metallurgical Industries, Inc. Process for forming a hardfacing surface including particulate refractory metal. 4,376,793, Cl. 427-34.000.
Jackson, Thomas E., to Steel Web Corporation. Truss employing both metallic and non-metallic webs. 4,376,362, Cl. 52-639.000.
Jacobson, Allan J.: *See*—
Johnson, Jack W.; and Jacobson, Allan J., 4,376,709, Cl. 252-1.000.
Jacoff, Daniel, to Great Neck Saw Manufacturers, Inc. Hack saw frame. 4,376,456, Cl. 145-33.00A.
Janiszewski, Gregorz K., to AB Volvo. Synchronizer for motor vehicle gearboxes. 4,376,475, Cl. 192-53.00F.
Jansen, Gert; and Wolff, Per. Chemical process. 4,376,867, Cl. 562-424.000.
Japan Atomic Energy Research Inst.: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.
Japan Aviation Electronics Industry Limited: *See*—
Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, 4,376,879, Cl. 200-314.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Kotani, Teizo; Enyo, Hiroji; Watanabe, Masaaki; and Takemura, Yasuhiko, 4,376,846, Cl. 525-205.000.
Jenkner, Herbert; and Strang, Robert, to Chemische Fabrik Kalk GmbH. Flame retardant tetrabromophthalic acid esters useful in synthetic resins. 4,376,837, Cl. 524-108.000.
Jernakoff, George, to General Electric Company. Electrodeless lamp operating circuit and method. 4,376,912, Cl. 315-248.000.
Jeumont-Schneider: *See*—
Peslier, Jacques F., 4,376,910, Cl. 315-134.000.
Job-Master Sales, Inc.: *See*—
Mondy, Clement R., Jr., 4,376,443, Cl. 134-168.00R.
Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,376,835, Cl. 523-116.000.
Joerns Furniture Company: *See*—
Mercier, Mark F.; and Damico, Frank M., 4,376,316, Cl. 5-66.000.
John D. Brush & Co., Inc.: *See*—
Burgess, George M., 4,376,380, Cl. 70-303.00A.
Johns, William E., to Washington State University Research Foundation. Particle board process using furan resin/isocyanate binder. 4,376,745, Cl. 264-109.000.
Johnson, Jack W.; and Jacobson, Allan J., to Exxon Research and Engineering Co. Intercalated layered mixed oxides. 4,376,709, Cl. 252-1.000.
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana W., to Honeywell Information Systems Inc. Sequential word aligned address apparatus. 4,376,972, Cl. 364-200.000.
Johnston, Bruce L., to Burke, Inc. Foldable step arrangement for beds. 4,376,317, Cl. 5-80.000.

Joseph, Ralph C.: *See*—
Hart, Robert J.; and Joseph, Ralph C., 4,376,584, Cl. 356-401.000.
Jujo Engineering Co., Ltd.: *See*—
Akai, Naoto, 4,376,530, Cl. 271-10.000.
Junek, Hans; and Thierrichter, Burkhard, to Lonza Ltd. 3-Amino-2-cyano-3-(5-amino-3-aryl-isoxazolo-4-yl)-acrylic acid methyl ester. 4,376,862, Cl. 548-249.000.
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Tridecapeptide. 4,376,760, Cl. 424-1.500.
Kabel-und Metallwerke Guteboffnungshuette AG: *See*—
Stenzel, Hans-Dieter, 4,376,741, Cl. 264-45.900.
Kabushiki Kaisha Daini Seikosha: *See*—
Takeda, Kazutoshi; and Sugimoto, Koichi, 4,376,810, Cl. 429-90.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Furukawa, Hideo; Okamoto, Masaaki; and Shinbori, Kazuyoshi, 4,376,335, Cl. 29-447.000.
Kojima, Yasuo; Morita, Koichi; Hoashi, Kenzo; and Aruga, Taketo, 4,376,371, Cl. 60-420.000.
Kabushiki Kaisha Nippon Coinco: *See*—
Sugimoto, Osamu; and Akagawa, Masaki, 4,376,478, Cl. 194-1.00N.
Sugimoto, Osamu; and Akagawa, Masaki, 4,376,479, Cl. 194-1.00N.
Kabushiki Kaisha Suwa Seikosha: *See*—
Aizawa, Hitomi, 4,376,992, Cl. 368-47.000.
Banda, Shunji, 4,376,567, Cl. 350-335.000.
Shimizu, Eisaku, 4,376,995, Cl. 368-107.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Iwata, Masayosi; Furuhashi, Kenshi; and Yokoyama, Tadashi, 4,376,878, Cl. 200-61.270.
Takeda, Nobuhiro; Mizuno, Shigeo; Takaishi, Yukio; and Hattori, Masaichi, 4,376,896, Cl. 307-115.000.
Kahle, Lisa M.; and Schultz, Stephen J., to PPG Industries, Inc. Apparatus for conveying glass sheets. 4,376,643, Cl. 65-351.000.
Kaifu, Nobuo: *See*—
Yamaguchi, Toyohiko; Kashima, Koichi; and Kaifu, Nobuo, 4,376,854, Cl. 528-137.000.
Kaiser, Robert, to United States of America, Air Force. Preparation of stable sodium carbonate dispersions. 4,376,716, Cl. 252-309.000.
Kaley, Robert C., to AMP Incorporated. Cam actuated socket for electrical leads. 4,376,562, Cl. 339-75.00M.
Kalvestrand, Donald R.: *See*—
Labti, Archie E.; Engelbrecht, Kenneth L.; and Kalvestrand, Donald R., 4,376,976, Cl. 364-200.000.
Kam, Lit-Yan: *See*—
Olsson, Billy E.; Kunkle, James R.; and Kam, Lit-Yan, 4,376,560, Cl. 339-17.0CF.
Kaman Aerospace Corporation: *See*—
Liff, Benjamin S., 4,376,446, Cl. 137-202.000.
Kaminow, Ivan P.; and Marcuse, Dietrich, to Bell Telephone Laboratories, Incorporated. Superluminescent LED with efficient coupling to optical waveguide. 4,376,946, Cl. 357-17.000.
Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,376,712, Cl. 252-49.600.
Kanamaru, Hisanobu; Okabe, Moisei; Tohkairin, Akira; and Tatsumi, Hideo, to Hitachi, Ltd. Method of joining members of metal by forced insertion. 4,376,333, Cl. 29-432.000.
Kanamori, Masaru: *See*—
Nagasawa, Kazutoshi; Kishino, Seigo; Matsushita, Yoshiaki; and Kanamori, Masaru, 4,376,657, Cl. 148-1.500.
Kanbe, Masumi: *See*—
Uchino, Hideo; Nomura, Masami; Aoi, Takaaki; and Kanbe, Masumi, 4,376,471, Cl. 187-29.00R.
Kaneda, Isao, to New Nippon Electric Co., Ltd. Circuit system for lighting a discharge lamp or lamps. 4,376,911, Cl. 315-244.000.
Kaneko, Mitsunori: *See*—
Inoue, Tomoaki; Ishikawa, Yoichi; and Kaneko, Mitsunori, 4,376,681, Cl. 204-1.00T.
Karban, Steven H.; Drexler, James V.; and Hennen, Cleon L., to Sperry Corporation. Real time speech compaction/relay with silence detection. 4,376,874, Cl. 179-15.55T.
Karol, Kenneth N., to International Business Machines Corporation. Flexible disk stabilizing structure. 4,376,960, Cl. 360-99.000.
Kashima, Koichi: *See*—
Yamaguchi, Toyohiko; Kashima, Koichi; and Kaifu, Nobuo, 4,376,854, Cl. 528-137.000.
Katayama, Yoshihiko: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,376,720, Cl. 252-430.000.
Katzman, Howard A., to Aerospace Corporation, The. Carbon-reinforced metal-matrix composites. 4,376,803, Cl. 428-408.000.
Katzman, Howard A., to Aerospace Corporation, The. Pyrolyzed pitch coatings for carbon fiber. 4,376,804, Cl. 428-408.000.
Kawakami, Yoshio: *See*—
Ishida, Toshihiko; Azegami, Hitoshi; and Kawakami, Yoshio, 4,376,519, Cl. 242-199.000.
Kawamatsu, Yutaka; Sobda, Takashi; and Hirata, Takeo, to Takeda Chemical Industries, Ltd. Thiazolidine derivatives use. 4,376,777, Cl. 424-270.000.
Kawasaki Steel Corporation: *See*—
Ohshimatani, Toshio; Mimura, Yukihiro; Nozawa, Kengo; Maguchi, Tatsuo; and Takitani, Keiichiro, 4,376,528, Cl. 266-114.000.
Kawasugi, Tadaaki: *See*—
Fujimoto, Tadao; Kawasugi, Tadaaki; Madokoro, Taketoshi; and Toriyama, Akio, 4,376,701, Cl. 210-96.100.
Kawazura, Hiroshi: *See*—
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, 4,376,768, Cl. 424-246.000.
Kawneer Company, Inc.: *See*—
Redman, Ronald E., 4,376,359, Cl. 52-127.000.
Kay, Edward L.: *See*—
Gutierrez, Richard; and Kay, Edward L., 4,376,853, Cl. 528-1.000.
Kazimov, Boris I.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Kazimov, Boris I.; Zagadarchuk, Vasily F.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,376,882, Cl. 219-100.000.
Kearney & Trecker Corporation: *See*—
Ilseman, Kenneth A.; and Caddell, Richard W., 4,376,970, Cl. 364-167.000.
Keenan, Michael P. Educational game for construction and identifying electrical and electronic circuits. 4,376,538, Cl. 273-275.000.
Keighley Grinders (Machine Tools) Ltd.: *See*—
Shackleton, Raymond T., 4,376,357, Cl. 51-105.0SP.
Kelleher, Kevin C., to RCA Corporation. Video disc player having timebase correction and constant angular velocity turntable. 4,376,956, Cl. 358-322.000.
Kelley Company Inc.: *See*—
Bedford, Robert C., 4,376,319, Cl. 14-71.300.
Kempter, Fritz E.; and Schupp, Eberhard, to BASF Aktiengesellschaft. Polyadduct/polycondensate containing basic nitrogen groups, its preparation and its use. 4,376,849, Cl. 525-490.000.
Kenney, Walter J.: *See*—
Brown, Robert L.; and Kenney, Walter J., 4,376,384, Cl. 72-135.000.
Kerekes, Bela, to Egyesult Izzolampa es Villamossagi Rt. Electric lamp provided with a ceramic discharge tube. 4,376,905, Cl. 313-217.000.
Kernforschungsanlage Julich GmbH: *See*—
Forster, Siegfried; Kleemann, Manfred; Quell, Peter; and Sack, Berthold, 4,376,627, Cl. 431-192.000.
Keshavan, Hampapur R.: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,376,998, Cl. 370-13.000.
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,376,999, Cl. 370-16.000.
Kidde, Inc.: *See*—
Banks, Harold H., 4,376,522, Cl. 248-503.100.
Iwans, Robert C., 4,376,314, Cl. 4-431.000.
Kilbourne, Kenneth B. Lightbulb lock. 4,376,564, Cl. 339-92.00R.
Kimberly-Clark Corporation: *See*—
Whitehead, Howard A.; Roeder, Robert J.; and Grube, Herbert E., 4,376,440, Cl. 604-387.000.
Kimpenhaus, Wolfgang: *See*—
Dietrich, Bernd; and Kimpenhaus, Wolfgang, 4,376,461, Cl. 165-170.000.
Kimsey, Cheston B. Insulated boot blanket. 4,376,344, Cl. 36-7.10R.
Kimura, Kenji, to Olympus Optical Company Ltd. Motor control device. 4,376,914, Cl. 318-603.000.
Kinugasa, Haruo; Hase, Koujirou; Takeshita, Shigeru; and Mizue, Masao, to Daihatsu Motor Co., Ltd.; and Daikin Manufacturing Co., Ltd. Power transmission for an automobile. 4,376,370, Cl. 60-337.000.
Kirchner, Tommy L.; and Powers, Hurshal G., to United States of America, Energy. Optical fuel pin scanner. 4,376,582, Cl. 356-71.000.
Kirin Beer Kabushiki Kaisha: *See*—
Miyazawa, Takashi, 4,376,951, Cl. 358-106.000.
Kishino, Seigo: *See*—
Nagasawa, Kazutoshi; Kishino, Seigo; Matsushita, Yoshiaki; and Kanamori, Masaru, 4,376,657, Cl. 148-1.500.
Kistner, Kenneth. Coating system. 4,376,512, Cl. 239-106.000.
Kitano, Takafumi: *See*—
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, 4,376,768, Cl. 424-246.000.
Kitrilakis, Sotiris: *See*—
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., 4,376,312, Cl. 3-1.700.
Klammers, Gerard: *See*—
Rossi, Alphonse; and Klammers, Gerard, 4,376,626, Cl. 431-66.000.
Kleemann, Axel: *See*—
Drauz, Karlheinz; Kleemann, Axel; and Samson, Marc, 4,376,864, Cl. 549-373.000.
Kleemann, Manfred: *See*—
Forster, Siegfried; Kleemann, Manfred; Quell, Peter; and Sack, Berthold, 4,376,627, Cl. 431-192.000.
Kleininger, Werner: *See*—
Burger, Rainer; and Kleininger, Werner, 4,376,414, Cl. 101-415.100.
Kleinschmit, Einhard: *See*—
Bartel, Gunter; Fiedler, Horst; Stotz, Manfred; and Kleinschmit, Einhard, 4,376,492, Cl. 220-210.000.
Kleinwefers GmbH: *See*—
Weidinger, Hans; Ehm, Werner; and Pav, Josef, 4,376,330, Cl. 29-116.0AD.
Klockner-Humboldt-Deutz AG: *See*—
Otte, Wilhelm; and Winckowski, Reinhold, 4,376,704, Cl. 210-326.000.
Knapstein, Carol A.: *See*—
Knapstein, Paul E., 4,376,423, Cl. 123-1.00A.
Knapstein, Paul E., to Knapstein, William C.; and Knapstein, Carol A. Method and apparatus for saturating a liquid fuel with a gas and an internal combustion engine. 4,376,423, Cl. 123-1.00A.

Knapstein, William C.: *See*—
Knapstein, Paul E., 4,376,423, Cl. 123-1.00A.
Knoop, Jack P.; Weiss, Joel R.; and Uy, James C., to International Business Machines Corporation. Composite magnetic recording disk. 4,376,963, Cl. 360-135.000.
Knowles, William S.: *See*—
Christopfel, William C.; and Knowles, William S., 4,376,870, Cl. 568-15.000.
Kobane, Sumio: *See*—
Komatu, Satoru; Kobane, Sumio; Yamamoto, Masanobu; Takahashi, Hiroshi; and Izumo, Terutsugu, 4,376,931, Cl. 340-58.000.
Kobayashi, Hideya: *See*—
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, 4,376,768, Cl. 424-246.000.
Kobayasi, Tomio; and Fukushi, Kouji, to Sony Corporation. Method of manufacturing magnetic transducer head. 4,376,337, Cl. 29-603.000.
Koch, Robert C.: *See*—
Davis, James A.; and Koch, Robert C., 4,376,838, Cl. 524-184.000.
Koenig, Horst: *See*—
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.
Koga, Tsuguaki: *See*—
Inoue, Tomoaki; Okano, Kinpei; Ikeuchi, Kazuo; and Koga, Tsuguaki, 4,376,389, Cl. 73-118.000.
Kohayakawa, Yoshimi: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,376,573, Cl. 351-212.000.
Kojima, Michio: *See*—
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, 4,376,778, Cl. 424-274.000.
Kojima, Yasuo; Morita, Koichi; Hoashi, Kenzo; and Aruga, Taketo, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic circuit for a hydraulically driven vehicle. 4,376,371, Cl. 60-420.000.
Kolb, Gerald C.: *See*—
Lalk, James W.; Kolb, Gerald C.; Tomalia, Donald A.; and Owen, Peter W., 4,376,861, Cl. 548-237.000.
Kolbel, Gert F., to Compret N.V. Push and pull type exercising device. 4,376,533, Cl. 272-137.000.
Komatu, Satoru; Kobane, Sumio; Yamamoto, Masanobu; Takahashi, Hiroshi; and Izumo, Terutsugu, to Meisei Electric Co., Ltd. System for detecting abnormality in internal pressure of tire. 4,376,931, Cl. 340-58.000.
Komiya, Kazumi; Yamashita, Toshio; and Ohno, Masaru, to Nippon Telegraph & Telephone Public Corp.; Matsushita Electric Industrial Co., Ltd.; and Matsushita Graphic Communication Systems, Inc. Method of producing image sensor. 4,376,795, Cl. 427-75.000.
Komori Printing Machinery Co., Ltd.: *See*—
Kuroda, Tamio, 4,376,413, Cl. 101-182.000.
Komura, Kisaburo; Ohshima, Masamitsu; and Matsuda, Masato, to Nippon Dyeing Machine Manufacturing Co. Ltd. Filtering and drying apparatus. 4,376,705, Cl. 210-413.000.
Konno, Tetsuro; and Konno, Tetsuro, to Seikosha Co., Ltd. Circuitry for switching effective electrode area on a crystal in a crystal oscillator to vary the oscillation frequency. 4,376,919, Cl. 331-158.000.
Konno, Tetsuro: *See*—
Konno, Tetsuro; and Konno, Tetsuro, 4,376,919, Cl. 331-158.000.
Koop, Bruce H. Car top carrier for wheelchair. 4,376,611, Cl. 414-462.000.
Kopic, Joachim: *See*—
Heyer, Gunter; Handke, Gunther; and Kopic, Joachim, 4,376,472, Cl. 188-322.220.
Koppers Company, Inc.: *See*—
Gerber, Donald J., 4,376,677, Cl. 202-267.00A.
Koral, Marvin: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,376,719, Cl. 252-426.000.
Kotani, Teizo; Enyo, Hiroji; Watanabe, Masaaki; and Takemura, Yasuhiko, to Japan Synthetic Rubber Co., Ltd. Rubbery polymer blends with anilino phenyl units. 4,376,846, Cl. 525-205.000.
Kott, Jacques. Search system for randomly classified objects. 4,376,936, Cl. 340-825.300.
Kotzur, Joachim; and Heinen, Manfred, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Gas seal for shafts with a compensating ring. 4,376,540, Cl. 277-3.000.
Koyama, Kazumi: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,376,984, Cl. 365-104.000.
Koyama, Kazuo: *See*—
Takechi, Hiroshi; Matsuo, Munetsugu; and Koyama, Kazuo, 4,376,661, Cl. 148-12.00C.
Krause, Hartmut; and Seifert, Gerd, to Siemens Aktiengesellschaft. X-Ray diagnostic generator comprising an inverter circuit feeding the high voltage transformer. 4,377,002, Cl. 378-093.000.
Krauss, Leonard. Oil filter cover. 4,376,703, Cl. 210-238.000.
Kreiskott, Horst: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; and Teschendorf, Hans-Juergen, 4,376,773, Cl. 424-251.000.
Kren, George J.: *See*—
Wheeler, William R.; Kren, George J.; and Clementson, David D., 4,376,482, Cl. 198-394.000.
Krewenka, Thomas: *See*—
Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, 4,376,884, Cl. 219-109.000.
Krings, Josef. Ditch shoring unit. 4,376,599, Cl. 405-282.000.
Kubacki, Edward F.: *See*—
Dao, Tan K.; Gold, Vance B.; Kubacki, Edward F.; and Sieverin, Walter J., 4,376,883, Cl. 219-109.000.
Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, 4,376,884, Cl. 219-109.000.
Kubota Ltd.: *See*—
Fujimoto, Tadao; Kawasugi, Tadaaki; Madokoro, Taketoshi; and Toriyama, Akio, 4,376,701, Cl. 210-96.100.
Kubota, Shigeru: *See*—
Moriwaki, Toshimoto; Hani, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, 4,376,840, Cl. 524-779.000.
Kuchuk-Yatsenko, Sergei I.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Kazimov, Boris I.; Zagadarchuk, Vasily F.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,376,882, Cl. 219-100.000.
Kudinov, Vladimir D.; and Filimonov, Boris V. Lining unit. 4,376,808, Cl. 428-558.000.
Kugler, Tibor, to Swiss Aluminium Ltd. Cathode for a cell for fused salt electrolysis. 4,376,690, Cl. 204-243.00R.
Kuhle, Engelbert; and Hagemann, Hermann, to Bayer Aktiengesellschaft. N-(Sulphenamido)-acyl isocyanates. 4,376,735, Cl. 260-453.0RW.
Kuhlthau, Hans-Peter: *See*—
Raue, Roderich; and Kuhlthau, Hans-Peter, 4,376,728, Cl. 260-165.000.
Kunkle, James R.: *See*—
Olsson, Billy E.; Kunkle, James R.; and Kam, Lit-Yan, 4,376,560, Cl. 339-17.0CF.
Kunze, Johannes: *See*—
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.
Kuo, Chang-Kiang: *See*—
Tsaur, Shyh-Chang; and Kuo, Chang-Kiang, 4,376,983, Cl. 365-53.000.
Kuo, Chun-Liang. Writing implement. 4,376,590, Cl. 401-57.000.
Kuroda, Tamio, to Komori Printing Machinery Co., Ltd. Apparatus for controlling timings of throwing on or off cylinders of printing press. 4,376,413, Cl. 101-182.000.
Kushima, Fumiyoshi: *See*—
Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, 4,376,879, Cl. 200-314.000.
Lackey, Walter J.: *See*—
Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., 4,376,792, Cl. 427-6.000.
Lackinger, Franz. Cable gland for use with unarmored electrical cables. 4,376,873, Cl. 174-65.0SS.
Lackwerke Wulfing GmbH & Co.: *See*—
Subramanyam, Arty R. T.; and Schroder, Manfred, 4,376,848, Cl. 525-452.000.
Lagana', Vincenzo; Saviano, Francesco; and Bisi, Piero, to Snamprogetti, S.p.A. Process for the preparation of gases which contain hydrogen and nitrogen. 4,376,717, Cl. 252-376.000.
Lahti, Archie E.; Engelbrecht, Kenneth L.; and Kalvestrand, Donald R., to Sperry Corporation. Overlapped macro instruction control system. 4,376,976, Cl. 364-200.000.
Lalk, James W.; Kolb, Gerald C.; Tomalia, Donald A.; and Owen, Peter W., to Dow Chemical Company, The. Method for preparing 2-alkenyl-2-oxazolines. 4,376,861, Cl. 548-237.000.
Lam, Tony Y. K., to Merck & Co., Inc. Hypocholesterolemic fermentation products. 4,376,863, Cl. 549-292.000.
Lamparski, Lester L.: *See*—
Nestrick, Terry J.; Peters, Thomas L.; and Lamparski, Lester L., 4,376,641, Cl. 55-67.000.
Landers, Don B.: *See*—
Britton, Frederick G.; Stanfield, William G.; and Landers, Don B., 4,376,597, Cl. 405-195.000.
Landgraf, Hans; Dorner, Joachim; Heinrich, Siegfried; and Horn, Manfred, to Gebr. Bode & Co. System for protection against getting caught in automatically operable doors or windows, particularly of vehicles. 4,376,971, Cl. 364-184.000.
Landmark, Jonas R.; and Schneider, Paul A., to Ardal og Sunndal Verk a.s. Method and equipment for removing packing coke from baking chambers for carbon bodies. 4,376,602, Cl. 406-115.000.
Lange, Karl-Heinz, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG. Camera with electronically controlled shutter and flash triggering assembly. 4,376,574, Cl. 354-147.000.
Lanik, Igor; Havelka, Otakar; and Pirochta, Dusan, to Vyzkumny ustav keramiky. Protective coating for foundry implements which contact molten aluminum alloys. 4,376,651, Cl. 106-38.240.
Lapeyre, Fernand S. Manually operable multi-speed bicycle transmission. 4,376,394, Cl. 74-750.00B.
Large, George B., to Stauffer Chemical Company. Tri-mixed alkylsulfonium salts of N-phosphonomethylglycine and their use as plant growth regulators and herbicides. 4,376,644, Cl. 71-87.000.
Larwa, Peter. Wheel. 4,376,351, Cl. 46-23.000.
Laseter, Douglas E. Material conveyor. 4,376,601, Cl. 406-64.000.
Laurien, Hanno: *See*—
Briem, Karl; and Laurien, Hanno, 4,376,750, Cl. 264-336.000.
Lautenschlager, Gerhard: *See*—
Lautenschlager, Horst; Lautenschlager, Gerhard; and Lautenschlager, Karl, Jr., 4,376,324, Cl. 16-236.000.

Lautenschlager, Horst; Lautenschlager, Gerhard; and Lautenschlager, Karl, Jr., to Mepla, Inc. Furniture hinge. 4,376,324, Cl. 16-236.000.
Lautenschlager, Karl, Jr.: *See*—
Lautenschlager, Horst; Lautenschlager, Gerhard; and Lautenschlager, Karl, Jr., 4,376,324, Cl. 16-236.000.
Lauterjung, Friedrich G. Suction bottle for medical purposes particularly for the connection of drainage tubes. 4,376,439, Cl. 128-276.000.
Lawson, J. Dennis: *See*—
Haedrich, Walter; and Lawson, J. Dennis, 4,376,403, Cl. 84-384.000.
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Kazimov, Boris I.; Zagadarchuk, Vasily F.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T. Method of resistance flash butt welding. 4,376,882, Cl. 219-100.000.
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, to BASF Aktiengesellschaft. 6-(p-Acylaminophenyl)-4,5-dihydropyridaz-3-ones and therapeutic agents containing said compounds. 4,376,771, Cl. 424-250.000.
Le Fur, Daniel: *See*—
Goldman, Max; Le Fur, Daniel; and Sotton, Michel, 4,376,964, Cl. 361-233.000.
Lehman, Peter G.: *See*—
Harney, Donald W. G.; Lehman, Peter G.; and Rundle, Joseph C., 4,376,784, Cl. 424-304.000.
Lehmann, Hans D.: *See*—
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.
Lehmann, Hans-Dieter, to Gambro Dialysatoren G.m.b.H. & Co. K.G. Process for the removal of urea from blood wash fluids and blood. 4,376,707, Cl. 210-679.000.
Lehnert, Gunther: *See*—
Straube, Franz A.; and Lehnert, Gunther, 4,376,438, Cl. 128-90.000.
Lejeune, Daniel, to Compagnie Generale des Etablissments Michelin. Bead rings of pneumatic tires. 4,376,458, Cl. 152-362.00R.
Lenke, Dieter: *See*—
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.
Lentsch, Steven E.; and Schmidt, William, to Economics Laboratory, Inc. Control of mastitis. 4,376,787, Cl. 424-315.000.
Lesher, George Y.; and Page, Donald F., to Sterling Drug Inc. N-[4-(4-Pyridinyl)phenyl]ureas and their cardiotonic use. 4,376,775, Cl. 424-263.000.
Leu, Erwin, to Mashinenfabrik Schweiter AG. Spooling machine, method and apparatus to prevent formation of cut remnant thread pieces. 4,376,516, Cl. 242-36.000.
LGZ Landis & Gyr Zug AG: *See*—
Greenaway, David L.; Clarinval, Joseph A.; and Nyfeler, Alex, 4,376,887, Cl. 235-487.000.
Licinvest AG: *See*—
Ackeret, Peter, 4,376,348, Cl. 40-513.000.
Lien, Jih-Chang: *See*—
Chiu, Te-Long; and Lien, Jih-Chang, 4,376,947, Cl. 357-23.000.
Lietti, Andrea; and Bonati, Attilio, to Inverni Della Beffa S.p.A. Pharmaceutical compositions. 4,376,781, Cl. 424-283.000.
Liff, Benjamin S., to Kaman Aerospace Corporation. Vent valve for fuel tanks and the like. 4,376,446, Cl. 137-202.000.
Linda, Fabio B. V., to Poolquip Industries (Proprietary Limited). Vacuum cleaner head for submerged surfaces. 4,376,320, Cl. 15-1.700.
Linde Aktiengesellschaft: *See*—
Lohr, Bernhard; Hesse, Peter; and Schuster, Robert, 4,376,694, Cl. 208-48.00R.
Lindenfors, Sven G., to Mooch Domsjo Aktiebolag. Process for preparing cellulose pulp filler for thermosetting resin molding powders. 4,376,852, Cl. 527-314.000.
Lindner, Christian; Braese, Hans-Eberhard; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Notched impact resistant vinyl chloride polymers. 4,376,843, Cl. 525-83.000.
Lindstrom, Olle. Electrolytic cell especially for chloralkali electrolysis with air electrode. 4,376,691, Cl. 204-265.000.
Little Giant Industries, Inc.: *See*—
Ashton, Larry J., 4,376,470, Cl. 182-23.000.
Liu, Philip J., to Aqua-Chem, Inc. Solar desalting process. 4,376,679, Cl. 203-71.000.
Lloyd, Norman E.: *See*—
Hurst, Louis S.; and Lloyd, Norman E., 4,376,824, Cl. 435-94.000.
LMT Radio Professionnelle: *See*—
Marchand, Maurice; and Haentjens, Yan, 4,377,005, Cl. 455-327.000.
Lockhart, Scott N.; Hohulin, Samuel E.; and Brooks, Joseph F., deceased (by Brooks, Elva M., executrix), to National Union Electric Corporation. Suction cleaner. 4,376,322, Cl. 15-323.000.
Lockheed Missiles & Space Company, Inc.: *See*—
Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., 4,376,608, Cl. 414-217.000.
Lohr, Bernhard; Hesse, Peter; and Schuster, Robert, to Linde Aktiengesellschaft. Method of decoking a cracking plant. 4,376,694, Cl. 208-48.00R.
Loizeau, Pierre, to Societe Anonyme Francaise du Ferodo. Torsion damping device particularly clutch friction more especially for motor vehicle. 4,376,477, Cl. 192-106.200.
Lombardo, Sebastian P. Tool-to-workpiece angle gauge. 4,376,341, Cl. 33-174.00S.
Long, Timothy: *See*—
Guccione, Leo A.; and Millar, David, 4,376,546, Cl. 280-770.000.
Longrod, Scott J., to SCM Corporation. Stepped acoustic transport member. 4,376,469, Cl. 181-142.000.
Loun, Dana R.: *See*—
Hampel, Wilbur J.; and Loun, Dana R., 4,376,630, Cl. 464-88.000.
Lonza Ltd.: *See*—
Junek, Hans; and Thierrichter, Burkhard, 4,376,862, Cl. 548-249.000.
Loos, Michel: *See*—
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,376,975, Cl. 364-200.000.
Lord, Thomas J.: *See*—
Haushalter, Frederick W.; and Lord, Thomas J., 4,376,619, Cl. 417-560.000.
Love, Douglas S., to E M I Limited. Bar feed. 4,376,398, Cl. 82-2.500.
Lowicki, Norbert; and Desai, Natvarlal B., to Grillo-Werke AG. Surfactants which are polyhydric alcohol partial esters of adducts of maleic anhydride with an unsaturated carboxylic acid. 4,376,789, Cl. 424-361.000.
Lu, Chen-i; and Morrison, Edward D. Optical lenses prepared from crosslinkable acrylic compositions. 4,376,800, Cl. 428-220.000.
Lucas, Robert G., to Electric Power Research Institute. Corrosion protection system for nuclear power plant. 4,376,753, Cl. 376-305.000.
Ludvigson, Birger. Device for tensioning a reinforcing strand. 4,376,527, Cl. 254-29.00A.
Ludwig, Volker; and Heitmann, Juergen, to Siemens Aktiengesellschaft. Method and circuitry arrangement for refreshing data stored in a dynamic MOS memory. 4,376,988, Cl. 365-222.000.
Lummus Company, The: *See*—
Apanel, George J., 4,376,865, Cl. 549-521.000.
Lutjens, Robert D.: *See*—
Duron, Paul P.; Tellez, Charles E.; and Lutjens, Robert D., 4,376,377, Cl. 62-55.500.
Luzio, Guillermo F.: *See*—
Saran, Amitabh; Luzio, Guillermo F.; and Betron, Frank A., 4,376,933, Cl. 340-347.0DD.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Kotzur, Joachim; and Heines, Manfred, 4,376,540, Cl. 277-3.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Burger, Rainer; and Kleininger, Werner, 4,376,414, Cl. 101-415.100.
M&T Chemicals Inc.: *See*—
Watson, Angus, 4,376,685, Cl. 204-52.00R.
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, to Japan Atomic Energy Research Inst.; and Yuasa Battery Co., Ltd. Process for production of separators for use in cells. 4,376,794, Cl. 427-44.000.
Madderra, Jimmy M., to United States of America, Army. Automatic hard-soft rocket detent system. 4,376,405, Cl. 89-1.806.
Madokoro, Taketoshi: *See*—
Fujimoto, Tadao; Kawasugi, Tadaaki; Madokoro, Taketoshi; and Toriyama, Akio, 4,376,701, Cl. 210-96.100.
Magid, David J.: *See*—
Banks, Russell; and Magid, David J., 4,376,500, Cl. 222-386.500.
Magnetic Peripherals Inc.: *See*—
Wickham, Thomas J., 4,376,338, Cl. 29-741.000.
Maguchi, Tatsuo: *See*—
Ohshimatani, Toshio; Mimura, Yukihiro; Nozawa, Kengo; Maguchi, Tatsuo; and Takitani, Keiichiro, 4,376,528, Cl. 266-114.000.
Maguire, Hugh C.: *See*—
Bohman, Carl E.; Maguire, Hugh C.; and Thompson, Bradley J., 4,376,609, Cl. 414-335.000.
Mah, Tai-Il, to Systems Research Laboratories, Inc. Fugitive liquid phase densification of silicon nitride. 4,376,742, Cl. 264-85.000.
Mail-Ex Corporation: *See*—
Russell, Robert J., 4,376,363, Cl. 53-52.000.
Malin, Miachael J., to Technicon Instruments Corporation. Heat stable, polymer-forming composition. 4,376,839, Cl. 524-303.000.
Mallinckrodt, Inc.: *See*—
Prior, Richard B.; and Spagna, Vincent A., 4,376,634, Cl. 436-502.000.
Mannesmann Aktiengesellschaft: *See*—
Fromme, Lorenz; Hendrischk, Wolfgang; and Rupp, Werner, 4,376,585, Cl. 400-185.000.
Marafioti, Luigi: *See*—
Horak, Edgardo; Casati, Alvaro; Bianucci, Giancarlo; Marafioti, Luigi; and Notarbartolo, Silvio, 4,376,680, Cl. 203-89.000.
Marcellis, Alphonso W.; and Grelecki, Chester J., to United States of America, Energy. Explosive composition comprising pentaborane and tris (difluoramino) fluoromethane. 4,376,665, Cl. 149-22.000.
Marchaj, Tadeusz J., to Preload Technology, Inc. Diffusion pump. 4,376,616, Cl. 417-153.000.
Marchand, Maurice; and Haentjens, Yan, to LMT Radio Professionnelle. Ultra-high frequency hybrid mixer. 4,377,005, Cl. 455-327.000.
Marcuse, Dietrich: *See*—
Kaminow, Ivan P.; and Marcuse, Dietrich, 4,376,946, Cl. 357-17.000.
Margrave, Shawn G.; and Nordeen, Donald L., to General Motors Corporation. Electrical connector with mechanically assisted latch means. 4,376,563, Cl. 339-91.00R.
Mark Controls Corporation: *See*—
Skough, Evert B., 4,376,448, Cl. 137-329.020.
Markevitch, Bob V.: *See*—
Brown, Hugh B.; Noble, Stephen C.; and Markevitch, Bob V., 4,376,950, Cl. 358-90.000.

Marshall, Robert M., to Allied Corporation. Finish composition for polyester yarn. 4,376,802, Cl. 428-378.000.

Martin, Harry L. Gold club grip configuration. 4,376,536, Cl. 273-81.400.

Martin, Thomas B., Jr.: *See*—
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., 4,376,312, Cl. 3-1.700.

Martinek, Harold H., to Teepak, Inc. Shaft coupling. 4,376,592, Cl. 403-26.000.

Maruyama, Shigeo: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,376,573, Cl. 351-212.000.

Maschinenfabrik Schweiter AG: *See*—
Leu, Erwin, 4,376,516, Cl. 242-36.000.

Masquelier, Michele M. L. G.: *See*—
Trouet, Andre B. L.; Masquelier, Michele M. L. G.; and Baurain, Roger M., 4,376,765, Cl. 424-177.000.

Masuda, Eiji; and Sakamoto, Shigemi, to Tokyo Shibaura Denki Kabushiki Kaisha. Overtone crystal oscillating circuit. 4,376,918, Cl. 331-116.0FE.

Math, Friedrich C., to British Petroleum Company Limited, The. Method of fabricating energy absorbing structure. 4,376,669, Cl. 156-161.000.

Matsubara, Tetsuyuki; Ito, Norifumi; Ishida, Yuzuru; and Iwamoto, Mune, to Mitsui Toatsu Chemicals, Inc. Process for the production of styrene polymers. 4,376,847, Cl. 525-262.000.

Matsuda, Masato: *See*—
Komura, Kisaburo; Ohshima, Masamitsu; and Matsuda, Masato, 4,376,705, Cl. 210-413.000.

Matsuhira, Shinya: *See*—
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,376,724, Cl. 252-460.000.

Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Apparatus for measuring the refractive power of the eye. 4,376,573, Cl. 351-212.000.

Matsuo, Munetsugu: *See*—
Takechi, Hiroshi; Matsuo, Munetsugu; and Koyama, Kazuo, 4,376,661, Cl. 148-12.00C.

Matsuo, Noritada; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Cyclopropanecarboxylates and a low fish toxic insecticide and/or acaricide containing them. 4,376,785, Cl. 424-304.000.

Matsushige, Takashi: *See*—
Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, 4,376,959, Cl. 360-72.200.

Matsushima, Takeo: *See*—
Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, 4,376,879, Cl. 200-314.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Komiya, Kazumi; Yamashita, Toshio; and Ohno, Masaru, 4,376,795, Cl. 427-75.000.
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,376,689, Cl. 204-195.00B.
Sakaira, Tadashi; Yamada, Hideyuki; and Wakahata, Tamotsu, 4,376,726, Cl. 252-519.000.

Matsushita Graphic Communication Systems, Inc.: *See*—
Komiya, Kazumi; Yamashita, Toshio; and Ohno, Masaru, 4,376,795, Cl. 427-75.000.

Matsushita, Yoshiaki: *See*—
Nagasawa, Kazutoshi; Kishino, Seigo; Matsushita, Yoshiaki; and Kanamori, Masaru, 4,376,657, Cl. 148-1.500.

Matsuura, Shinzo: *See*—
Narisada, Masayuki; Okada, Tetso; Yoshida, Tadashi; and Matsuura, Shinzo, 4,376,770, Cl. 424-248.510.

Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 4-fluoro-3-phenoxy-benzyl 3-alken-1-yl-2,2-dimethyl-cyclopropanecarboxylates. 4,376,786, Cl. 424-304.000.

Maurer, Werner; and Zimmer, Johann, to Bayer Aktiengesellschaft. Process for the preparation of aniline condensation dyestuffs. 4,376,859, Cl. 544-348.000.

Maydan, Dan: *See*—
Wang, David N.; Egitto, Frank D.; and Maydan, Dan, 4,376,672, Cl. 156-643.000.

Mayer, Herbert E., to Cessor Patent- und Versuchs-Anstalt. Method of positioning disk-shaped workpieces, preferably semiconductor wafers. 4,376,581, Cl. 355-77.000.

Mazur, Joseph S., to Eaton Corporation. Centrifugal fan control. 4,376,424, Cl. 123-41.120.

McCartney, Robert F.; and Nazarenko, Nicholas, to Du Pont de Nemours, E. I., and Company. Process for the preparation of triaryloboranes. 4,376,869, Cl. 568-1.000.

McCash, Benjamin L.: *See*—
Tomasek, Donald J.; and McCash, Benjamin L., 4,376,473, Cl. 192-3.580.

McDonnell Douglas Corporation: *See*—
Hsia, Yukun, 4,376,987, Cl. 365-184.000.

McGalliard, James D. Printed circuit fuse assembly. 4,376,927, Cl. 337-297.000.

McGinness, Robert L., to Teledyne Industries, Inc. Hot workability of an age hardenable nickle base alloy. 4,376,650, Cl. 75-129.000.

McGuire, Robert J.: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,376,998, Cl. 370-13.000.
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,376,999, Cl. 370-16.000.

McNab, Ian R.: *See*—
Hummert, George T.; and McNab, Ian R., 4,376,615, Cl. 417-50.000.

Meat Management, Inc.: *See*—
Coffey, Theodore E., 4,376,622, Cl. 425-139.000.

Mefferd, Wayne S., to Coherent, Inc. Method of constructing a gaseous laser. 4,376,328, Cl. 445-28.000.

Meiji Seika Kaisha, Ltd.: *See*—
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, 4,376,778, Cl. 424-274.000.

Meisei Electric Co., Ltd.: *See*—
Komata, Satoru; Kobane, Sumio; Yamamoto, Masanobu; Takahashi, Hiroshi; and Izumo, Terutsugu, 4,376,931, Cl. 340-58.000.

Meisenheimer, Daniel T., Jr. Self-closing breakaway valve assembly including improved valve mounting with rotation limiting stop. 4,376,445, Cl. 137-68.00R.

Meister, Jack B. Electromechanical switching device. 4,376,895, Cl. 307-9.000.

Meloy Laboratories, Inc.: *See*—
Braude, Irwin A., 4,376,821, Cl. 435-68.000.
Braude, Irwin A., 4,376,822, Cl. 435-68.000.

Melrose Displays, Inc.: *See*—
Cohen, Melvin, 4,376,502, Cl. 224-42.430.

Mengler, Claus-Dieter: *See*—
Vangermain, Erwin; and Mengler, Claus-Dieter, 4,376,718, Cl. 252-416.000.

Mepla, Inc.: *See*—
Lautenschlager, Horst; Lautenschlager, Gerhard; and Lautenschlager, Karl, Jr., 4,376,324, Cl. 16-236.000.

Mercier, Mark F.; and Damico, Frank M., to Joerns Furniture Company. Hinge for adjustable beds and the like. 4,376,316, Cl. 5-66.000.

Merck & Co., Inc.: *See*—
Hannah, John, 4,376,774, Cl. 424-263.000.
Lam, Tony Y. K., 4,376,863, Cl. 549-292.000.
Saari, Walfred S.; and Huff, Joel R., 4,376,772, Cl. 424-250.000.
Sloan, Kenneth B., 4,376,767, Cl. 424-232.000.

Merck Sharp & Dohme (I.A.) Corp.: *See*—
Belanger, Patrice C.; and Young, Robert N., 4,376,779, Cl. 424-274.000.

Merrill Lynch Pierce, Fenner & Smith: *See*—
Musmanno, Thomas E., 4,376,978, Cl. 364-408.000.

Merten, Gerhard: *See*—
Breuer, Oswald; and Merten, Gerhard, 4,376,553, Cl. 299-34.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Schwartz, Werner; and Fischer, Peter, 4,376,649, Cl. 75-78.000.

Metallurgical Industries, Inc.: *See*—
Jackson, Hewy E., 4,376,793, Cl. 427-34.000.

Metallurgical Processes Limited: *See*—
Smith, Maurice R., 4,376,754, Cl. 420-573.000.

Metchev, Alexander, to "Eumig" Elektrizitas- und Metallwaren-Industrie Gesellschaft m.b.H. Device for transit time measurement and method. 4,376,990, Cl. 367-95.000.

Metzger, Bruce A., to Dow Chemical Company, The. Three-component polymer blends and adhesive films prepared therefrom. 4,376,845, Cl. 525-196.000.

Metzger, Lenard M. High speed, non-saturating, bipolar transistor logic circuit. 4,376,900, Cl. 307-473.000.

Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., to Lockheed Missiles & Space Company, Inc. Kinetic extruder - a dry pulverized solid material pump. 4,376,608, Cl. 414-217.000.

Michael, Harald, to Electrolux GmbH. Vacuum operated check valve for vacuum conduits. 4,376,444, Cl. 137-1.000.

Michael, Ralph E., to United States Gypsum Company. Partition wall construction. 4,376,361, Cl. 52-241.000.

Micro-Plate, Inc.: *See*—
Eidschun, Charles D., 4,376,684, Cl. 204-15.000.

Micro Technology Laboratory Co., Ltd.: *See*—
Mishima, Matsuo, 4,376,903, Cl. 310-154.000.

Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Antenna arrangements for suppressing selected sidelobes. 4,376,940, Cl. 343-840.000.

Miles Laboratories, Inc.: *See*—
Rupchock, Patricia A.; and Skjold, Arthur C., 4,376,828, Cl. 436-97.000.
Stiso, Sisto N.; and White-Stevens, Rodric H., 4,376,827, Cl. 436-2.000.

Millar, David: *See*—
Guccione, Leo A.; and Millar, David, 4,376,546, Cl. 280-770.000.

Miller, Nathan W. Safety halter for horses. 4,376,366, Cl. 54-24.000.

Miller, Richard G., to Illinois Tool Works Inc. Method of making terminal clamp assembly. 4,376,334, Cl. 29-437.000.

Millett, James A.: *See*—
Raymond, James W.; and Millett, James A., 4,376,382, Cl. 70-338.000.

Milliken Research Corporation: *See*—
Wilson, David B., 4,376,368, Cl. 57-264.000.

Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., to Occidental Chemical Company. Process for blending phosphoric acids of differing impurity content. 4,376,756, Cl. 423-317.000.

Mimura, Yukihiro: *See*—
Ohshimatani, Toshio; Mimura, Yukihiro; Nozawa, Kengo; Maguchi, Tatsuo; and Takitani, Keiichiro, 4,376,528, Cl. 266-114.000.

Minolta Camera Kabushiki Kaisha: *See*—
Tanaka, Susumu; and Oka, Tateki, 4,376,578, Cl. 355-15.000.
Yuge, Shizuo; Yamamoto, Toshio; and Sakakibara, Susuma, 4,376,813, Cl. 430-100.000.

Minster Machine Company, The: *See*—
Wissman, Terry L.; and Schoch, Daniel A., 4,376,410, Cl. 100-214.000.

Mirsch, John W.: *See*—
Gross, Josef; Barkow, William H.; and Mirsch, John W., 4,376,924, Cl. 335-210.000.

Mishima, Matsuo, to Micro Technology Laboratory Co., Ltd. Direct current dynamo electric machine. 4,376,903, Cl. 310-154.000.

Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, to Showa Denko Kabushiki Kaisha. Rhodium catalyst and method for preparing the same. 4,376,724, Cl. 252-460.000.

Mitel Corporation: *See*—
Beirne, Patrick R., 4,376,875, Cl. 179-18.00B.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Moriwaki, Toshimoto; Hani, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, 4,376,840, Cl. 524-779.000.
Sasao, Isao, 4,376,930, Cl. 340-19.00R.
Uchino, Hideo; Nomura, Masami; Aoi, Takaaki; and Kanbe, Masumi, 4,376,471, Cl. 187-29.00R.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Ohtawa, Kimiaki; Tokuda, Masahiro; and Fukada, Yasuo, 4,376,648, Cl. 75-35.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Ohashi, Minoru; and Iwaosa, Katsuaki, 4,376,818, Cl. 430-623.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Ishida, Yuzuru; and Iwamoto, Mune, 4,376,847, Cl. 525-262.000.
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, 4,376,768, Cl. 424-246.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Sakagami, Seiji, 4,376,543, Cl. 277-237.00R.

Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Nitrogen-containing acrylic copolymer composition. 4,376,687, Cl. 204-181.00C.

Miyazawa, Takashi, to Kirin Beer Kabushiki Kaisha. Foreign matter detecting device. 4,376,951, Cl. 358-106.000.

Mizue, Masao: *See*—
Kinugasa, Haruo; Hase, Koujirou; Takeshita, Shigeru; and Mizue, Masao, 4,376,370, Cl. 60-337.000.

Mizuno, Kisaburo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Engine air/fuel ratio control system with both normal idling and idle up idling capability. 4,376,427, Cl. 123-339.000.

Mizuno, Shigeo: *See*—
Takeda, Nobuhiro; Mizuno, Shigeo; Takaishi, Yukio; and Hattori, Masaichi, 4,376,896, Cl. 307-115.000.

Mizusaki, Yoshinobu, to Nissin Kogyo Kabushiki Kaisha. Observing window device for liquid tanks. 4,376,490, Cl. 220-82.00R.

Mobil Oil Corporation: *See*—
Chester, Arthur W.; and Murray, James G., 4,376,722, Cl. 252-430.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,376,712, Cl. 252-49.600.
Penick, Joe E., 4,376,697, Cl. 208-120.000.

Moeller, Dennis L., to International Business Machines Corporation. Bi-directional serial printer with look-ahead. 4,376,588, Cl. 400-322.000.

Moertel, George B. Waste disposer unit. 4,376,365, Cl. 53-555.000.

Mohr, Robert G.: *See*—
Vanden Hoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,376,561, Cl. 339-21.00R.

Momiyama, Kikuo: *See*—
Someya, Hiromi and Momiyama, Kikuo, 4,376,575, Cl. 354-155.000.

Momma, Yoshinobu: *See*—
Hataishi, Osamu and Momma, Yoshinobu, 4,376,664, Cl. 148-175.000.

Mondy, Clement R., Jr., to Stewart & Stevenson Services, Inc.; and Job-Master Sales, Inc., a part interest. Jet water cleaning apparatus. 4,376,443, Cl. 134-168.00R.

Monogram Industries, Inc.: *See*—
Pratt, John D.; and Huynh, Cu S., 4,376,604, Cl. 411-34.000.

Monsanto Company: *See*—
Christopfel, William C.; and Knowles, William S., 4,376,870, Cl. 568-15.000.

Montanari, Roberto, to Stabilimento Bioterapico Farmacologico La Farmochimica Italiana, S.p.A. Basic ethers of 4-hydroxy-benzophenones acting as beta-blocking agents. 4,376,788, Cl. 424-330.000.

Montedison S.p.A.: *See*—
Pagani, Giorgio; Bosco, Dino; and Brambilla, Lorenzo, 4,376,758, Cl. 423-359.000.

Mooch Domsjo Aktiebolag: *See*—
Lindenfors, Sven G., 4,376,852, Cl. 527-314.000.

Moore, Dana W.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana W., 4,376,972, Cl. 364-200.000.

Moretti, Luciano; and Dotti, Giulio, to Centro Ricerche Fiat S.p.A. Hydraulic distributor. 4,376,453, Cl. 137-625.640.

Morgan, Charles J. Access port for a commode. 4,376,313, Cl. 4-255.000.

Mori, Haruki: *See*—
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, 4,376,768, Cl. 424-246.000.

Mori, Sanae, to Daido Metal Company, Ltd. Connecting rod of radial piston motor and method of producing same. 4,376,393, Cl. 74-579.00R.

Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, to Victor Company of Japan, Limited. Address signal generator for prerecorded signal sources. 4,376,959, Cl. 360-72.200.

Morita, Koichi: *See*—
Kojima, Yasuo; Morita, Koichi; Hoashi, Kenzo; and Aruga, Taketo, 4,376,371, Cl. 60-420.000.

Moritomo, Takao: *See*—
Torii, Michihiro; Moritomo, Takao; Suzuki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, 4,376,961, Cl. 360-106.000.

Moriwaki, Toshimoto; Hani, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, to Mitsubishi Denki Kabushiki Kaisha. Flame retardant liquid rubber composition. 4,376,840, Cl. 524-779.000.

Morrison, Edward D.: *See*—
Lu, Chen-i; and Morrison, Edward D., 4,376,800, Cl. 428-220.000.

Moser, Phillip J.: *See*—
Bednarz, John J.; Moser, Phillip J.; and Rosenberg, Roger L., 4,376,350, Cl. 43-26.100.

Moss, Elvis W.: *See*—
Gifford, Richard L.; Hlava, Lorens G.; and Moss, Elvis W., 4,376,518, Cl. 242-84.20R.

Motor Wheel Corporation: *See*—
Woelfel, James A., 4,376,749, Cl. 264-258.000.

Motorola, Inc.: *See*—
Reid, James B., 4,376,939, Cl. 343-715.000.

Mountcastle, Paul H.: *See*—
Dickens, Lawrence E.; and Mountcastle, Paul H., 4,376,921, Cl. 333-116.000.

Muller, Rostislav: *See*—
Van Soest, Cornelius J. M.; Muller, Rostislav; and Bagaric, Stjepan, 4,376,487, Cl. 212-147.000.

Mumford, George V., to Owens-Illinois, Inc. Child resistant dispensing closure. 4,376,497, Cl. 222-153.000.

Murata, Kazuo: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.

Murdock, David L.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,376,756, Cl. 423-317.000.

Murray, James G.: *See*—
Chester, Arthur W.; and Murray, James G., 4,376,722, Cl. 252-430.000.

Muschner, Udo: *See*—
Hafner, Alfred; and Muschner, Udo, 4,376,501, Cl. 222-600.000.

Muselet, Andre; and Muselet, Jacques, to Snauwaert & Depla. Machine for stringing rackets. 4,376,535, Cl. 273-73.00A.

Muselet, Jacques: *See*—
Muselet, Andre; and Muselet, Jacques, 4,376,535, Cl. 273-73.00A.

Musmanno, Thomas E., to Merrill Lynch Pierce, Fenner & Smith. Securities brokerage-cash management system. 4,376,978, Cl. 364-408.000.

Muus, Frank, to Elkem A/S. Lock. 4,376,381, Cl. 70-337.000.

Muzslay, Steven Z., to ITT. Filter connector. 4,376,922, Cl. 333-182.000.

Myers, deceased; George D., to Ashland Oil, Inc. Addition of $MgCl_2$ to catalyst for cracking carbo-metallic feed oils. 4,376,696, Cl. 208-120.000.

Myhre, Kjell E. Optimized stress and strain distribution diaphragms. 4,376,929, Cl. 338-4.000.

Mynatt, Roy L. Continuous production of bacteria for leaching of metallic ore. 4,376,826, Cl. 435-253.000.

Nabeta, Teiichi: *See*—
Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, 4,376,879, Cl. 200-314.000.

Nabisco Brands, Inc.: *See*—
Hurst, Louis S.; and Lloyd, Norman E., 4,376,824, Cl. 435-94.000.

Nagasawa, Kazutoshi; Kishino, Seigo; Matsushita, Yoshiaki; and Kanamori, Masaru, to VLSI Technology Research Association. Method of making fault-free surface zone in semiconductor devices by step-wise heat treating. 4,376,657, Cl. 148-1.500.

Nagashima, Masaru, to Diesel Kiki Co., Ltd. Heat exchanger. 4,376,459, Cl. 165-96.000.

Nagata, Masumi; Kushima, Fumiyoshi; Matsushima, Takeo; Fujioka, Yasuhiro; Iwata, Yasuhiro; and Nabeta, Teiichi, to Japan Aviation Electronics Industry Limited. Button-less push switch boards. 4,376,879, Cl. 200-314.000.

Nagatani, Kazuo, to Sakurai Machine Trading Co., Ltd. Squeegee pressing device in a screen printing machine. 4,376,412, Cl. 101-124.000.

Naimpally, Saiprasad V. Signal separation networks. 4,376,953, Cl. 358-197.000.

Nakagiri, Takashi: *See*—
Fukuda, Tadaji; and Nakagiri, Takashi, 4,376,888, Cl. 250-211.00J.

Nakajo, Tetsuo: *See*—
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,376,724, Cl. 252-460.000.

Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, to Matsushita Electric Industrial Co., Ltd. Coenzyme immobilized electrode. 4,376,689, Cl. 204-195.00B.
Nakashima, Shinobu: *See*—
Tanaka, Chiaki; and Nakashima, Shinobu, 4,376,856, Cl. 528-292.000.
Nakata, Kouji: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, 4,376,656, Cl. 106-309.000.
Nankai, Shiro: *See*—
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,376,689, Cl. 204-195.00B.
Narayan, Jagdish; and Chen, Yok, to United States of America, Energy. Production of crystalline refractory metal oxides containing colloidal metal precipitates and useful as solar-effective absorbers. 4,376,755, Cl. 423-275.000.
Narisada, Masayuki; Okada, Tetso; Yoshida, Tadashi; and Matsuura, Shinzo, to Shionogi & Co., Ltd. Cephalosporin analoga for oral use. 4,376,770, Cl. 424-248.510.
Nati, Salvatore F., Jr.: *See*—
Bedard, James F.; Cutler, Scott E.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,376,969, Cl. 363-78.000.
National Distillers & Chemical Corp.: *See*—
Hinnenkamp, James A.; and Walatka, Vernon V., Jr., 4,376,757, Cl. 423-332.000.
National Research Institute for Metals: *See*—
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tsutomu, 4,376,740, Cl. 264-10.000.
National Union Electric Corporation: *See*—
Lockhart, Scott N.; Hohulin, Samuel E.; and Brooks, Joseph F., deceased, 4,376,322, Cl. 15-323.000.
Nauheimer, James F., to Container Corporation of America. Three-cell partition. 4,376,507, Cl. 229-15.000.
Nazarenko, Nicholas: *See*—
McCartney, Robert F.; and Nazarenko, Nicholas, 4,376,869, Cl. 568-1.000.
Nazem, Faramarz, to Union Carbide Corporation. Process for controlling the cross-sectional structure of mesophase pitch derived fibers. 4,376,747, Cl. 264-176.00F.
NCR Corporation: *See*—
Reitberger, Peter H.; and Ruprich, Wilhelm, 4,376,944, Cl. 346-140.00R.
Stewart, John W.; Woelk, Darrell W.; and DeForest, Marvin R., 4,376,974, Cl. 364-200.000.
Nedelec, Lucien: *See*—
Torelli, Vesperto; and Nedelec, Lucien, 4,376,734, Cl. 260-397.300.
Nelson, Milton T. Perpetual calendar. 4,376,346, Cl. 40-114.000.
Nelson, Robert E.: *See*—
Nelson, Robert M.; and Nelson, Robert E., 4,376,449, Cl. 137-391.000.
Nelson, Robert M.; and Nelson, Robert E., to Nelson, Robert M. Two reservoir system in which fluid is drawn from one to maintain a level in the other. 4,376,449, Cl. 137-391.000.
Nelson, Robert T.: *See*—
Shelton, John J., 4,376,358, Cl. 51-429.000.
NER Data Products, Inc.: *See*—
Banker, Harold, Jr., 4,376,491, Cl. 220-200.000.
Nestrick, Terry J.; Peters, Thomas L.; and Lamparski, Lester L., to Dow Chemical Company, The. Coated capillary chromatographic column. 4,376,641, Cl. 55-67.000.
New Nippon Electric Co., Ltd.: *See*—
Kaneda, Isao, 4,376,911, Cl. 315-244.000.
Newby, Robert A.; and York, Gregg E. Apparatus for variably spacing a driving tool and a driven tool. 4,376,397, Cl. 81-177.00A.
Nibby, Chester M., Jr.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana W., 4,376,972, Cl. 364-200.000.
Nicoud, Jean-Francois: *See*—
Chemla, Dahiel; Zyss, Joseph; and Nicoud, Jean-Francois, 4,376,899, Cl. 307-425.000.
Nield, Gerald L.; Yang, Kang; and Washecheck, Paul H., to Conoco Inc. Alkoxylation of cresylic acids. 4,376,868, Cl. 562-465.000.
Nimer, Edward L.; and Campbell, Robert W., to Chevron Research Company. Sulfur cement-aggregate-organosilane compositions and methods for preparing. 4,376,830, Cl. 501-140.000.
Nintendo Co., Ltd.: *See*—
Yokoi, Gunpei, 4,376,537, Cl. 273-153.00S.
Nippon Dyeing Machine Manufacturing Co. Ltd.: *See*—
Komura, Kisaburo; Ohshima, Masamitsu; and Matsuda, Masato, 4,376,705, Cl. 210-413.000.
Nippon Electric Co., Ltd.: *See*—
Abe, Hideaki; and Yamashita, Koji, 4,377,003, Cl. 455-90.000.
Nippon Electric Glass Company, Limited: *See*—
Daiku, Nobutaka, 4,376,829, Cl. 501-64.000.
Nippon Steel Corporation: *See*—
Takechi, Hiroshi; Matsuo, Munetsugu; and Koyama, Kazuo, 4,376,661, Cl. 148-12.00C.
Nippon Telegraph & Telephone Public Corp.: *See*—
Komiya, Kazumi; Yamashita, Toshio; and Ohno, Masaru, 4,376,795, Cl. 427-75.000.
Nippon Tensaiseito Kabushiki Kaisha: *See*—
Takeda, Reiji; and Oikawa, Shozo, 4,377,001, Cl. 374-17.000.
Nissan Motor Company, Limited: *See*—
Hata, Yoshitaka; and Shioyama, Giichi, 4,376,428, Cl. 123-417.000.
Iijima, Tetsuya; and Yano, Hiroshi, 4,376,408, Cl. 98-2.030.
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,376,426, Cl. 123-198.00F.
Nissin Kogyo Kabushiki Kaisha: *See*—
Mizusaki, Yoshinobu, 4,376,490, Cl. 220-82.00R.
Niwa, Tomizo: *See*—
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, 4,376,778, Cl. 424-274.000.
Noble, Stephen C.: *See*—
Brown, Hugh B.; Noble, Stephen C.; and Markevitch, Bob V., 4,376,950, Cl. 358-90.000.
Nomura, Masami: *See*—
Uchino, Hideo; Nomura, Masami; Aoi, Takaaki; and Kanbe, Masumi, 4,376,471, Cl. 187-29.00R.
Nordeen, Donald L.: *See*—
Margrave, Shawn G.; and Nordeen, Donald L., 4,376,563, Cl. 339-91.00R.
Norfleet, James: *See*—
Barth, Jordan; and Norfleet, James, 4,376,763, Cl. 424-49.000.
Noroy, Terje, to Hamjern A/S. Apparatus for flaying of small cattle, especially sheep carcasses, in slaughtering. 4,376,326, Cl. 17-21.000.
Notarbartolo, Silvio: *See*—
Horak, Edgardo; Casati, Alvaro; Bianucci, Giancarlo; Marafioti, Luigi; and Notarbartolo, Silvio, 4,376,680, Cl. 203-89.000.
Novak, W. Thomas; and Volmer, David W., to Computervision Corporation. Projection aligner with bending mirror. 4,376,580, Cl. 355-52.000.
Nozawa, Katsumi: *See*—
Toyoda, Akira; Arima, Shizuo; Nozawa, Katsumi; and Igarashi, Kenji, 4,376,618, Cl. 417-417.000.
Nozawa, Kengo: *See*—
Ohshimatani, Toshio; Mimura, Yukihiro; Nozawa, Kengo; Maguchi, Tatsuo; and Takitani, Keiichiro, 4,376,528, Cl. 266-114.000.
Nuckolls, John H.; Thiessen, Albert R.; and Dahlbacka, Glen H., to United States of America, Energy. Foam encapsulated targets. 4,376,752, Cl. 376-152.000.
Nyfeler, Alex: *See*—
Greenaway, David L.; Clarinval, Joseph A.; and Nyfeler, Alex, 4,376,887, Cl. 235-487.000.
Occidental Chemical Company: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,376,756, Cl. 423-317.000.
Oddi, Michael J.; and Orio, Alfred P. Method of applying photoresist by screening in the formation of printed circuits. 4,376,815, Cl. 430-313.000.
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Time detecting device for alarm clock. 4,376,994, Cl. 368-74.000.
Ohashi, Minoru; and Iwaosa, Katsuaki, to Mitsubishi Paper Mills, Ltd. Novel hardener for gelatin and method for hardening gelatin. 4,376,818, Cl. 430-623.000.
Ohno, Masaru: *See*—
Komiya, Kazumi; Yamashita, Toshio; and Ohno, Masaru, 4,376,795, Cl. 427-75.000.
Ohno, Satoru: *See*—
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tsutomu, 4,376,740, Cl. 264-10.000.
Ohshima, Masamitsu: *See*—
Komura, Kisaburo; Ohshima, Masamitsu; and Matsuda, Masato, 4,376,705, Cl. 210-413.000.
Ohshimatani, Toshio; Mimura, Yukihiro; Nozawa, Kengo; Maguchi, Tatsuo; and Takitani, Keiichiro, to Kawasaki Steel Corporation. Steel pipe hardening apparatus. 4,376,528, Cl. 266-114.000.
Ohtawa, Kimiaki; Tokuda, Masahiro; and Fukada, Yasuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for producing reduced iron. 4,376,648, Cl. 75-35.000.
Oikawa, Shozo: *See*—
Takeda, Reiji; and Oikawa, Shozo, 4,377,001, Cl. 374-17.000.
Oil States Industries, Inc.: *See*—
Britton, Frederick G.; Stanfield, William G.; and Landers, Don B., 4,376,597, Cl. 405-195.000.
Oka, Tateki: *See*—
Tanaka, Susumu; and Oka, Tateki, 4,376,578, Cl. 355-15.000.
Okabe, Moisei: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tohkairin, Akira; and Tatsumi, Hideo, 4,376,333, Cl. 29-432.000.
Okada, Tetso: *See*—
Narisada, Masayuki; Okada, Tetso; Yoshida, Tadashi; and Matsuura, Shinzo, 4,376,770, Cl. 424-248.510.
Okami, Yoshiro; Yamada, Kazuhiko; and Takashio, Masachika, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Homocitric acid oligoriboside derivative for prevention of dental caries. 4,376,761, Cl. 424-48.000.
Okamoto, Katsuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic copying apparatus. 4,376,577, Cl. 355-3.0DR.
Okamoto, Masaaki: *See*—
Furukawa, Hideo; Okamoto, Masaaki; and Shinbori, Kazuyoshi, 4,376,335, Cl. 29-447.000.
Okano, Hiroshi; and Yamazaki, Masami, to Toyota Jidosha Kogyo Kabushiki Kaisha. Turbocharger for use in an internal combustion engine. 4,376,617, Cl. 417-407.000.
Okano, Kinpei: *See*—
Inoue, Tomoaki; Okano, Kinpei; Ikeuchi, Kazuo; and Koga, Tsuguaki, 4,376,389, Cl. 73-118.000.

Okazaki, Yutaka: *See*—
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, 4,376,768, Cl. 424-246.000.
Oklahoma Basic Economy Corporation: *See*—
Cantrell, Steven M., 4,376,425, Cl. 123-90.380.
Olson, Billy E.; Kunkle, James R.; and Kam, Lit-Yan, to AMP Incorporated. Socket for a ceramic chip carrier. 4,376,560, Cl. 339-17.0CF.
Olympus Optical Company Ltd.: *See*—
Kimura, Kenji, 4,376,914, Cl. 318-603.000.
Omura, Hideo: *See*—
Horino, Shigeo; Taniguchi, Shoji; and Omura, Hideo, 4,376,364, Cl. 53-54.000.
Onder, Kemal: *See*—
Goldwasser, David J.; and Onder, Kemal, 4,376,834, Cl. 521-159.000.
O'Neill, Christopher J.: *See*—
Bird, Philip S.; and O'Neill, Christopher J., 4,376,565, Cl. 339-186.00M.
Onishi, Takanori: *See*—
Horikoshi, Masafumi; Sato, Michikatsu; and Onishi, Takanori, 4,376,369, Cl. 60-276.000.
Onuma, Akira: *See*—
Hayashi, Yoshio; Onuma, Akira; and Shiga, Tetsuo, 4,376,816, Cl. 430-347.000.
Oriental Yeast Co., Ltd.: *See*—
Inoue, Tomoaki; Ishikawa, Yoichi; and Kaneko, Mitsunori, 4,376,681, Cl. 204-1.00T.
Orio, Alfred P.: *See*—
Oddi, Michael J.; and Orio, Alfred P., 4,376,815, Cl. 430-313.000.
Osrow, Harold; and Shulman, Elliott, to Osrow Products Corporation. Extrusion die for a pasta-making kitchen appliance. 4,376,624, Cl. 425-464.000.
Osrow Products Corporation: *See*—
Osrow, Harold; and Shulman, Elliott, 4,376,624, Cl. 425-464.000.
Ostergaard, Steen, to Stig Ravn A/S. Container with dispensing element. 4,376,499, Cl. 222-339.000.
Otis Engineering Corporation: *See*—
Crow, Robert W., 4,376,464, Cl. 166-324.000.
Ott, Karl-Heinz: *See*—
Lindner, Christian; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 4,376,843, Cl. 525-83.000.
Otte, Wilhelm; and Winckowski, Reinhold, to Klockner-Humboldt-Deutz AG. Vacuum double drum filter. 4,376,704, Cl. 210-326.000.
Ovren, Christer: *See*—
Engstrom, Olof; and Ovren, Christer, 4,376,890, Cl. 250-227.000.
Owen, Peter W.: *See*—
Lalk, James W.; Kolb, Gerald C.; Tomalia, Donald A.; and Owen, Peter W., 4,376,861, Cl. 548-237.000.
Owens-Illinois, Inc.: *See*—
Mumford, George V., 4,376,497, Cl. 222-153.000.
Oy Wartsila Ab: *See*—
Soininen, Pentti; and Henrichson, Olle, 4,376,352, Cl. 49-68.000.
Ozaki, Shoichiro; Kobayashi, Hideya; Mori, Haruki; Kitano, Takafumi; Kawazura, Hiroshi; and Okazaki, Yutaka, to Mitsui Toatsu Chemicals, Inc. Benzothiazine derivative. 4,376,768, Cl. 424-246.000.
PACCAR Inc.: *See*—
Strauss, J. Gerrold, 4,376,550, Cl. 296-102.000.
Pachonik, Horst: *See*—
Behn, Reinhard; Pachonik, Horst; and Seebacher, Gerhard, 4,376,329, Cl. 29-25.420.
Packwood, Rodney H.: *See*—
Belinko, Keith; Patmore, David J.; Packwood, Rodney H.; and Ranganathan, Ramaswami, 4,376,695, Cl. 208-59.000.
Pagani, Giorgio; Bosco, Dino; and Brambilla, Lorenzo, to Montedison S.p.A. Process for synthesizing ammonia from hydrocarbons. 4,376,758, Cl. 423-359.000.
Page, Donald F.: *See*—
Lesher, George Y.; and Page, Donald F., 4,376,775, Cl. 424-263.000.
Pardon, John F.: *See*—
Collinson-Jones, Rosalind I.; and Pardon, John F., 4,376,766, Cl. 424-177.000.
Parker-Hannifin Corporation: *See*—
Clark, James T., 4,376,331, Cl. 29-219.000.
Partos, Richard D., to American Hoechst Corporation. Method of inhibiting polymerization of vinyl aromatic compounds. 4,376,678, Cl. 203-9.000.
Passey, John R., Jr. Heated air bleed idle needle. 4,376,739, Cl. 261-142.000.
Passovoy, Richard H., to Anodex. Door frame assembly. 4,376,354, Cl. 49-504.000.
Patmore, David J.: *See*—
Belinko, Keith; Patmore, David J.; Packwood, Rodney H.; and Ranganathan, Ramaswami, 4,376,695, Cl. 208-59.000.
Pattillo, Phillip D.; and Wadlington, William H., to Standard Oil Company (Indiana). Method of applying tensile stress to a casing. 4,376,463, Cl. 166-285.000.
Pav, Josef: *See*—
Weidinger, Hans; Ehm, Werner; and Pav, Josef, 4,376,330, Cl. 29-116.0AD.
Penick, Joe E., to Mobil Oil Corporation. Fluid catalytic cracking. 4,376,697, Cl. 208-120.000.
Penn, Paul E., to Dart Controls, Inc. Tachometer. 4,376,915, Cl. 324-168.000.
Pennwalt Corporation: *See*—
Cheung, Peter P. L., 4,376,673, Cl. 156-662.000.
Perrotta, Kenneth A., to Whatman Reeve Angel Limited. Method of manufacturing an inorganic fiber filter tube and product. 4,376,675, Cl. 162-145.000.
Perry, Thomas J.: *See*—
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,376,975, Cl. 364-200.000.
Peslier, Jacques F., to Jeumont-Schneider. Power supply and control device for the proper operation of a railway traffic light. 4,376,910, Cl. 315-134.000.
Peters, Thomas L.: *See*—
Nestrick, Terry J.; Peters, Thomas L.; and Lamparski, Lester L., 4,376,641, Cl. 55-67.000.
Petersen, Olfert H.: *See*—
Boas, Peter F.; and Petersen, Olfert H., 4,376,325, Cl. 17-18.000.
Peterson, Francis C., to Illinois Tool Works Inc. Load-distributing washer for plastic members. 4,376,606, Cl. 411-155.000.
Peterson, LuVerne R.: *See*—
Elmasry, Mohamed I.; and Peterson, LuVerne R., 4,376,986, Cl. 365-159.000.
Petro-Metals Recovery Systems Limited: *See*—
Scott, Terrence I.; Westlake, Vincent H.; and Bridle, Michael K., 4,376,706, Cl. 210-678.000.
Petrolite Corporation: *See*—
Bellos, Thomas J., 4,376,708, Cl. 210-705.000.
Pettibone, Joseph S.; and Wheeler, Paul C., to United States of America, Energy. Magnetocumulative generator. 4,376,901, Cl. 310-10.000.
Pettigrew, Archibald M., to Elcomatic Limited. Modified frequency modulation. 4,376,958, Cl. 360-41.000.
Pfaff Industriemaschinen GmbH: *See*—
Willenbacher, Erich, 4,376,415, Cl. 112-121.110.
Pfahler, Gerhard: *See*—
Wiezer, Hartmut; and Pfahler, Gerhard, 4,376,836, Cl. 524-100.000.
Phan, Trung H.: *See*—
Cognard, Jacques; and Phan, Trung H., 4,376,715, Cl. 252-301.160.
Philips, Nicholas A.: *See*—
Gardner, Jeffrey M.; and Philips, Nicholas A., 4,376,508, Cl. 229-28.00R.
Phillips, Ian: *See*—
Versteeg, Gijsbert W.; Phillips, Ian; and Enggrav, Eilev, 4,376,876, Cl. 179-77.000.
Phillips Petroleum Company: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; and Eastman, Alan D., 4,376,698, Cl. 208-215.000.
Gardner, Lloyd E., 4,376,699, Cl. 208-215.000.
Hogan, John P.; and Banks, Robert L., 4,376,851, Cl. 526-351.000.
Warzel, F. Morgan, 4,376,693, Cl. 208-11.0LE.
Piaget, Valentin, to Complications S.A. Electronic watch with analogic display. 4,376,991, Cl. 368-37.000.
Pilhall, Stig T. L., to AB Volvo. Back seat headrest. 4,376,552, Cl. 297-391.000.
Pilkington P.E. Limited: *See*—
Swift, David W., 4,376,889, Cl. 250-213.0VT.
Pindstrup Mosebrug A/S: *See*—
Soe, Niels, 4,376,515, Cl. 241-101.00B.
Pingaud, Bernard J., to Eastman Kodak Company. Process for preparing acicular iron oxide particles. 4,376,714, Cl. 252-62.560.
Piper, Hugh V.: *See*—
Tunnell, James H.; and Piper, Hugh V., 4,376,474, Cl. 192-4.00A.
Pirochta, Dusan: *See*—
Lanik, Igor; Havelka, Otakar; and Pirochta, Dusan, 4,376,651, Cl. 106-38.240.
Pissiotas, Georg: *See*—
Rohr, Otto; and Pissiotas, Georg, 4,376,646, Cl. 71-120.000.
Pitney Bowes Inc.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,376,981, Cl. 364-570.000.
Pittman, Charles D. Solar powered air conditioning system. 4,376,435, Cl. 126-435.000.
Plath, Peter: *See*—
Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, 4,376,645, Cl. 71-105.000.
Poclain: *See*—
Yeou, Victor, 4,376,612, Cl. 414-694.000.
Policarpo, Armando: *See*—
Charpak, Georges; Hoan, N'Guyen N.; Policarpo, Armando; and Sauli, Fabio, 4,376,892, Cl. 250-372.000.
Polynovus Industries, Inc.: *See*—
Rodish, John, 4,376,670, Cl. 156-244.210.
Pommer, Ernst-Heinrich: *See*—
Rentzea, Costin; Feuerherd, Karl-Heinz; Zeeh, Bernd; Sauter, Hubert; and Pommer, Ernst-Heinrich, 4,376,776, Cl. 424-267.000.
Poolquip Industries (Proprietary Limited): *See*—
Linda, Fabio B. V., 4,376,320, Cl. 15-1.700.
Powers, Hurshal G.: *See*—
Kirchner, Tommy L.; and Powers, Hurshal G., 4,376,582, Cl. 356-71.000.
PPG Industries, Inc.: *See*—
Kahle, Lisa M.; and Schultz, Stephen J., 4,376,643, Cl. 65-351.000.
Prabhu, Ashok N.; and Hang, Kenneth W., to RCA Corporation. Conductor inks. 4,376,725, Cl. 252-512.000.
Pratt, John D.; and Huynh, Cu S., to Monogram Industries, Inc. Blind fastener for composite materials. 4,376,604, Cl. 411-34.000.
Precision Instruments, Inc.: *See*—
Green, Talmage O., 4,376,386, Cl. 73-1.00C.

Preload Technology, Inc.: *See*—
Marchaj, Tadeusz J., 4,376,616, Cl. 417-153.000.
Principe, Joseph R.: *See*—
Hauschild, John P.; and Principe, Joseph R., 4,376,762, Cl. 424-49.000.
Prior, Richard B.; and Spagna, Vincent A., to Mallinckrodt, Inc. Assay kit having syringe, dilution device and reagents within sealed container. 4,376,634, Cl. 436-502.000.
Pro Quip, Inc.: *See*—
Eggers, Frederick S., 4,376,997, Cl. 369-270.000.
Pro-Sac, S.p.A.: *See*—
Ferretti, Romeo, 4,376,833, Cl. 521-122.000.
Products and Patents Ltd.: *See*—
Stevens, Bernard; and Squires, Gregg W., 4,376,387, Cl. 74-11.000.
Proffer, Charles L. Container cap with neck abutting retractable liquid pickup structure. 4,376,591, Cl. 401-127.000.
Prohaska, Hans; and Rachner, Horst, to ITT Industries, Inc. Display system. 4,376,934, Cl. 340-815.170.
Prosenz, Pius. Traffic guide employable as a median barrier and road edge barrier. 4,376,594, Cl. 404-6.000.
PTX-Pentronix, Inc.: *See*—
DeSantis, Raymond P., 4,376,744, Cl. 264-106.000.
Purrmann, Robert: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,376,835, Cl. 523-116.000.
Quell, Peter: *See*—
Forster, Siegfried; Kleemann, Manfred; Quell, Peter; and Sack, Berthold, 4,376,627, Cl. 431-192.000.
Questor Corporation: *See*—
Cone, Richard E., 4,376,551, Cl. 297-250.000.
Rachner, Horst: *See*—
Prohaska, Hans; and Rachner, Horst, 4,376,934, Cl. 340-815.170.
Ramer, Richard M.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,376,756, Cl. 423-317.000.
Ramirez, Enrique G., to Dow Chemical Co., The. Niobium or tantalum catalysts for the preparation of ethylenimine. 4,376,732, Cl. 260-239.00E.
Ramun, John R.: *See*—
Ramun, Michael; and Ramun, John R., 4,376,340, Cl. 30-134.000.
Ramun, Michael; and Ramun, John R. Material handling and shearing attachment for a backhoe. 4,376,340, Cl. 30-134.000.
Ranganathan, Ramaswami: *See*—
Belinko, Keith; Patmore, David J.; Packwood, Rodney H.; and Ranganathan, Ramaswami, 4,376,695, Cl. 208-59.000.
Raue, Roderich; and Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Process for the preparation of cationic alkylarylhydrazone dyestuffs and color bases thereof. 4,376,728, Cl. 260-165.000.
Rauscher, Gunter; and Formanek, Helmut. Method and apparatus for producing electron beam diffraction patterns. 4,376,891, Cl. 250-307.000.
Raychem Corporation: *See*—
Diaz, Stephen H., 4,376,798, Cl. 428-43.000.
Raymond, James W.; and Millett, James A., to Raymond, James W. Resettable lock assembly. 4,376,382, Cl. 70-338.000.
Raytheon Company: *See*—
Toth, John F.; Conti, Richard J.; Cavallaro, Nunzio M.; and Dowling, Thomas B., 4,376,938, Cl. 343-700.0MS.
RCA Corporation: *See*—
Dischert, Robert A.; Williams, James J., Jr.; and Reitmeier, Glenn A., 4,376,948, Cl. 358-13.000.
Dischert, Robert A.; and Flory, Robert E., 4,376,957, Cl. 358-334.000.
Gross, Josef; Barkow, William H.; and Mirsch, John W., 4,376,924, Cl. 335-210.000.
Kelleher, Kevin C., 4,376,956, Cl. 358-322.000.
Prabhu, Ashok N.; and Hang, Kenneth W., 4,376,725, Cl. 252-512.000.
Reitmeier, Glenn A., 4,376,955, Cl. 358-314.000.
Ross, Michael D., 4,376,954, Cl. 358-312.000.
Troiano, Anthony, 4,376,952, Cl. 358-166.000.
Reber, Jean F.: *See*—
Steiger, Rolf; and Reber, Jean F., 4,376,817, Cl. 430-578.000.
Redman, Ronald E., to Kawneer Company, Inc. Fastener clip for glazed doors. 4,376,359, Cl. 52-127.000.
Reid, James B., to Motorola, Inc. Positive lock for deployable whip antennas. 4,376,939, Cl. 343-715.000.
Reinhardt, Robert M.; and Daigle, Donald J., to United States of America, Agriculture. Zwitterion compounds as catalysts in easy-care finishing. 4,376,633, Cl. 8-184.000.
Reinmuth, A. I. Carburetion control apparatus. 4,376,738, Cl. 261-63.000.
Reitberger, Peter H.; and Ruprich, Wilhelm, to NCR Corporation. Ink jet print head with tilting nozzle. 4,376,944, Cl. 346-140.00R.
Reitmeier, Glenn A., to RCA Corporation. Two dimensional adaptive dropout compensator and chroma inverter. 4,376,955, Cl. 358-314.000.
Reitmeier, Glenn A.: *See*—
Dischert, Robert A.; Williams, James J., Jr.; and Reitmeier, Glenn A., 4,376,948, Cl. 358-13.000.
Reliance Universal, Inc.: *See*—
Cannon, Dickson Y.; and Wolfe, Norman G., 4,376,807, Cl. 428-528.000.
Rentzea, Costin; Feuerherd, Karl-Heinz; Zeeh, Bernd; Sauter, Hubert; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Dibenzofuran derivatives and their use for controlling fungi. 4,376,776, Cl. 424-267.000.
Repwell Associates, Inc.: *See*—
Bothwell, Bruce E., 4,376,374, Cl. 60-687.000.
Research Corporation: *See*—
Turkevich, John; and Burchenal, Joseph H., 4,376,782, Cl. 424-287.000.
Rex, Donald K., to International Business Machines Corporation. Print ribbon protection. 4,376,587, Cl. 400-247.000.
Reynolds Metals Company: *See*—
Schardein, Daniel J., 4,376,801, Cl. 428-336.000.
Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft: *See*—
Dietrich, Bernd; and Kimpenhaus, Wolfgang, 4,376,461, Cl. 165-170.000.
Rines, Glen A., to Sanders Associates, Inc. Fiber optic angular accelerometer. 4,376,390, Cl. 73-517.00A.
Risdon Enterprises, Inc: *See*—
Sullivan, William E., 4,376,483, Cl. 206-484.000.
Robert Bosch GmbH: *See*—
Gunschmann, Peter; and Wolf, Theo, 4,376,962, Cl. 360-130.320.
Zahn, Heinrich, 4,376,503, Cl. 226-181.000.
Robineau, Maurice: *See*—
Bouron, Pierre; Robineau, Maurice; and Thiery, Alain, 4,376,451, Cl. 137-588.000.
Robinson, James E.; and Siwko, Eric I., to Entwistle Company, The. Extruder with temperature control. 4,376,623, Cl. 425-143.000.
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., to Foxcroft Associates. Hydraulically actuated cardiac prosthesis. 4,376,312, Cl. 3-1.700.
Rockwell International Corporation: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,376,998, Cl. 370-13.000.
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,376,999, Cl. 370-16.000.
Rocquin, Elsas L. Rake. 4,376,367, Cl. 56-400.170.
Rodish, John, to Polynovus Industries, Inc. Method for coating paper with a plastic pattern. 4,376,670, Cl. 156-244.210.
Roeder, Robert J.: *See*—
Whitehead, Howard A.; Roeder, Robert J.; and Grube, Herbert E., 4,376,440, Cl. 604-387.000.
Rogerson Aircraft Controls: *See*—
Badger, Everett H.; and Rogerson, Michael J., 4,376,315, Cl. 4-431.000.
Rogerson, Michael J.: *See*—
Badger, Everett H.; and Rogerson, Michael J., 4,376,315, Cl. 4-431.000.
Rohm and Haas Company: *See*—
Emmons, William D.; and Feely, Wayne E., 4,376,844, Cl. 525-117.000.
Rohr, Otto; and Pissiotas, Georg, to Ciba-Geigy Corporation. Herbicidal N-[4-(3'-alkoxyphenoxy)-phenyl]-N'-methylureas. 4,376,646, Cl. 71-120.000.
Rosenberg, Roger L.: *See*—
Bednarz, John J.; Moser, Phillip J.; and Rosenberg, Roger L., 4,376,350, Cl. 43-26.100.
Rosenfeld, Jack L.: *See*—
Bantz, David F.; Choquet, Michel F.; and Rosenfeld, Jack L., 4,376,982, Cl. 364-900.000.
Roskott, Lodewijk, to Akzona Incorporated. Copolymerization of unsaturated polyester resins. 4,376,841, Cl. 525-23.000.
Roskott, Lodewijk: *See*—
Beyleveld, Wilhelmus M.; and Roskott, Lodewijk, 4,376,842, Cl. 525-27.000.
Ross, Michael D., to RCA Corporation. Slow down processor for video disc mastering having color phase error detector/corrector. 4,376,954, Cl. 358-312.000.
Rossi, Alphonse; and Klammers, Gerard, to Etablissements Eugene Scholtes. Device for the control of a sequential burner of a cooking apparatus. 4,376,626, Cl. 431-66.000.
Roussel Uclaf: *See*—
Torelli, Vesperto; and Nedelec, Lucien, 4,376,734, Cl. 260-397.300.
Rowe, William A., to Zenith Radio Corporation. Color projection TV systems. 4,376,949, Cl. 358-60.000.
Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Enzyme amplification compounds for assays for androgens. 4,376,825, Cl. 435-188.000.
Rundle, Joseph C.: *See*—
Harney, Donald W. G.; Lehman, Peter G.; and Rundle, Joseph C., 4,376,784, Cl. 424-304.000.
Rupchock, Patricia A.; and Skjold, Arthur C., to Miles Laboratories, Inc. Bilirubin test kit. 4,376,828, Cl. 436-97.000.
Rupp, Werner: *See*—
Fromme, Lorenz; Hendrischk, Wolfgang; and Rupp, Werner, 4,376,585, Cl. 400-185.000.
Ruprich, Wilhelm: *See*—
Reitberger, Peter H.; and Ruprich, Wilhelm, 4,376,944, Cl. 346-140.00R.
Russell, Robert J., to Mail-Ex Corporation. Envelope processing machine having visual processing verification means. 4,376,363, Cl. 53-52.000.
S.F.E.N.A.: *See*—
Sicre, Jean L., 4,376,980, Cl. 364-565.000.
Saari, Walfred S.; and Huff, Joel R., to Merck & Co., Inc. Use of piperazinyl-imidazo[1,2-a]pyrazines in sedation. 4,376,772, Cl. 424-250.000.

Sack, Berthold: *See*—
Forster, Siegfried; Kleemann, Manfred; Quell, Peter; and Sack, Berthold, 4,376,627, Cl. 431-192.000.
Safonnikov, Anatoly N.; and Antonov, Anatoly V. Method of electroslag welding with a plate electrode. 4,376,881, Cl. 219-73.100.
Sakagami, Seiji, to Mitutoyo Mfg. Co., Ltd. Dust excluding device. 4,376,543, Cl. 277-237.00R.
Sakaira, Tadashi; Yamada, Hideyuki; and Wakahata, Tamotsu, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing composition for bonded magnets. 4,376,726, Cl. 252-519.000.
Sakakibara, Susumu: *See*—
Yuge, Shizuo; Yamamoto, Toshio; and Sakakibara, Susumu, 4,376,813, Cl. 430-100.000.
Sakamoto, Shigemi: *See*—
Masuda, Eiji; and Sakamoto, Shigemi, 4,376,918, Cl. 331-116.0FE.
Sakharnov, Vasily A.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Kazimov, Boris I.; Zagadarchuk, Vasily F.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,376,882, Cl. 219-100.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Tsuyama, Shigeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Olefin polymerization catalyst and olefin polymerization method using such catalyst. 4,376,720, Cl. 252-430.000.
Sakurai Machine Trading Co., Ltd.: *See*—
Nagatani, Kazuo, 4,376,412, Cl. 101-124.000.
Sale, Francis M.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,376,756, Cl. 423-317.000.
Samson, Marc: *See*—
Drauz, Karlheinz; Kleemann, Axel; and Samson, Marc, 4,376,864, Cl. 549-373.000.
Sandefur, Don J. Tool for repairing and replacing damaged studs. 4,376,332, Cl. 29-402.080.
Sanders Associates, Inc.: *See*—
Rines, Glen A., 4,376,390, Cl. 73-517.00A.
Sandorf, Ake. Ski brake. 4,376,545, Cl. 280-605.000.
Sanner, James W., to Dow Chemical Company, The. Aqueous phase polymerization of water miscible monomers. 4,376,850, Cl. 526-196.000.
Sano, Ken-ichi: *See*—
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,376,724, Cl. 252-460.000.
Saran, Amitabh; Luzio, Guillermo F.; and Betron, Frank A., to Xerox Corporation. Circuit for compacting data. 4,376,933, Cl. 340-347.0DD.
Sasao, Isao, to Mitsubishi Denki Kabushiki Kaisha. Call signal conversion apparatus for elevator system. 4,376,930, Cl. 340-19.00R.
Sato, Michikatsu: *See*—
Horikoshi, Masafumi; Sato, Michikatsu; and Onishi, Takanori, 4,376,369, Cl. 60-276.000.
Sato, Yasushi; and Hayakawa, Shigeru, to Food Science Institute Foundation, The. Method of separating globin. 4,376,727, Cl. 260-112.00B.
Sato, Yasushi: *See*—
Hara, Toshitami; Sato, Yasushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,376,945, Cl. 346-140.00R.
Sauli, Fabio: *See*—
Charpak, Georges; Hoan, N'Guyen N.; Policarpo, Armando; and Sauli, Fabio, 4,376,892, Cl. 250-372.000.
Sauter, Hubert: *See*—
Rentzea, Costin; Feuerherd, Karl-Heinz; Zeeh, Bernd; Sauter, Hubert; and Pommer, Ernst-Heinrich, 4,376,776, Cl. 424-267.000.
Saviano, Francesco: *See*—
Lagana', Vincenzo; Saviano, Francesco; and Bisi, Piero, 4,376,717, Cl. 252-376.000.
Schaefer, Rudolf. Body assembly. 4,376,593, Cl. 403-231.000.
Schaeffer-Homberg GmbH, Firma: *See*—
Birkhofer, Herbert, 4,376,504, Cl. 227-32.000.
Schaffer, George H. Liquid container with carrying handle. 4,376,509, Cl. 229-52.00B.
Schardein, Daniel J., to Reynolds Metals Company. Selective coating for solar collectors. 4,376,801, Cl. 428-336.000.
Schering Corporation: *See*—
Sherlock Margaret H., 4,376,769, Cl. 424-246.000.
Schippers, Heinz, to Barmag Barmer Maschinenfabrik AG. Method and apparatus for depositing yarn. 4,376,517, Cl. 242-47.000.
Schmid, August, to Serania AG. Bowling pin cable adjustment arrangement. 4,376,534, Cl. 273-44.000.
Schmidt, William: *See*—
Lentsch, Steven E.; and Schmidt, William, 4,376,787, Cl. 424-315.000.
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Calcium depleted aluminum fluorosilicate glass powder for use in dental or bone cements. 4,376,835, Cl. 523-116.000.
Schmolka, Irving R., to BASF Wyandotte Corporation. Silver ion gel compositions. 4,376,764, Cl. 424-78.000.
Schneider, Paul A.: *See*—
Landmark, Jonas R.; and Schneider, Paul A., 4,376,602, Cl. 406-115.000.
Schoch, Daniel A.: *See*—
Wissman, Terry L.; and Schoch, Daniel A., 4,376,410, Cl. 100-214.000.
Schoenwald, Klaus, to Siemens Aktiengesellschaft. Side channel compressor. 4,376,613, Cl. 415-53.00T.
Schroder, Manfred: *See*—
Subramanyam, Arty R. T.; and Schroder, Manfred, 4,376,848, Cl. 525-452.000.
Schulie, Klaus, to Alfa-Laval, Inc. Valve. 4,376,454, Cl. 137-798.000.
Schultz, Stephen J.: *See*—
Kahle, Lisa M.; and Schultz, Stephen J., 4,376,643, Cl. 65-351.000.
Schulz, Galyn A., to American Can Company. Multi-ply fibrous web structure and its manufacture. 4,376,671, Cl. 156-549.000.
Schumacher, William G., to International Harvester Co. Implement wheel. 4,376,554, Cl. 301-63.0DD.
Schupp, Eberhard: *See*—
Kempter, Fritz E.; and Schupp, Eberhard, 4,376,849, Cl. 525-490.000.
Schuster, Hans-Joachim: *See*—
Hellwig, Hubertus; Schuster, Hans-Joachim; and Heppner, Klaus-Dieter, 4,376,683, Cl. 204-15.000.
Schuster, James: *See*—
Garza, Robert L., 4,376,631, Cl. 474-255.000.
Schuster, Robert: *See*—
Lohr, Bernhard; Hesse, Peter; and Schuster, Robert, 4,376,694, Cl. 208-48.00R.
Schwartz, Werner; and Fischer, Peter, to Metallgesellschaft Aktiengesellschaft. Continuous process of smelting metallic lead directly from lead-and sulfur-containing materials. 4,376,649, Cl. 75-78.000.
Sciaky, Albert M.; Farrell, William J.; and Solomon, Julius L., to Sciaky Bros., Inc. Method for electron beam welding. 4,376,886, Cl. 219-121.0ED.
Sciaky Bros., Inc.: *See*—
Sciaky, Albert M.; Farrell, William J.; and Solomon, Julius L., 4,376,886, Cl. 219-121.0ED.
SCM Corporation: *See*—
Longrod, Scott J., 4,376,469, Cl. 181-142.000.
Weber, Leon, 4,376,655, Cl. 106-300.000.
Scott, Terrence I.; Westlake, Vincent H.; and Bridle, Michael K., to Petro-Metals Recovery Systems Limited. Chromium and zinc removal and recovery by ion exchange. 4,376,706, Cl. 210-678.000.
Scovill Manufacturing Co. - Scovill, Inc.: *See*—
Fayfield, Robert W.; and Fontaine, Kenneth B., 4,376,450, Cl. 137-554.000.
Seaboard Wellhead Control, Inc.: *See*—
Freeman, John W., 4,376,526, Cl. 251-328.000.
Sears, Roebuck and Co.: *See*—
Gall, John C., 4,376,493, Cl. 220-307.000.
Sedam, Jason K.; and Fuerst, William R., to Coca-Cola Company, The. Post-mix beverage dispensing system syrup package, valving system, and carbonator therefor. 4,376,496, Cl. 222-83.500.
Seebacher, Gerhard: *See*—
Behn, Reinhard; Pachomik, Horst; and Seebacher, Gerhard, 4,376,329, Cl. 29-25.420.
Seifert, Gerd: *See*—
Krause, Hartmut; and Seifert, Gerd, 4,377,002, Cl. 378-093.000.
Seiko Koki Kabushiki Kaisha: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,376,994, Cl. 368-74.000.
Seikosha Co., Ltd.: *See*—
Konno, Tetsuro; and Konno, Tetsuro, 4,376,919, Cl. 331-158.000.
Seki, Yoichi: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,376,994, Cl. 368-74.000.
Semperit Aktiengellschaft: *See*—
Beckmann, Otto, 4,376,667, Cl. 156-83.000.
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, to Titan Kogyo K.K. Heat resistant yellow iron oxide pigment. 4,376,656, Cl. 106-309.000.
Senoo, Keizi: *See*—
Machi, Saeo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanao, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.
Senor, Ronald E., to Texas Instruments Incorporated. Motor protector calibratable by housing deformation having improved sealing and compactness. 4,376,926, Cl. 337-104.000.
Seragnoli, Enzo, to G.D. Societa per Azioni. Device for checking the soundness of the cigarettes in a packeting machine. 4,376,484, Cl. 209-535.000.
Serania AG: *See*—
Schmid, August, 4,376,534, Cl. 273-44.000.
Sette, Vincent E.; and Fellman, Edward. Tow bar lock. 4,376,544, Cl. 280-507.000.
SGL Industries, Inc.: *See*—
Instone, John C., Jr., 4,376,559, Cl. 339-14.00R.
Shackleton, Raymond T., to Keighley Grinders (Machine Tools) Ltd. Machine tools. 4,376,357, Cl. 51-105.0SP.
Shah, Rameschandra V., to General Electric Company. Method for rapidly testing quality of incompletely charged electrochemical cells. 4,376,485, Cl. 209-575.000.
Shaub, Harold, to Exxon Research and Engineering Co. Lubricant composition. 4,376,711, Cl. 252-32.70E.
Shaw, Arthur. Monolithic water-permeable concrete roadway and related large area structures with integral drainage elements. 4,376,595, Cl. 404-17.000.
Sheltered Workshop for the Disabled, Inc.: *See*—
Blackington, Paul A., 4,376,566, Cl. 350-96.200.
Shelton, John J., to Nelson, Robert T. Surface treating apparatus. 4,376,358, Cl. 51-429.000.

Shelton, William S., to ACF Industries, Incorporated. Low stress stem connection structure for a non-rising stem type gate valve. 4,376,524, Cl. 251-86.000.
Sherlock Margaret H., to Schering Corporation. Substituted imidazo thiazoles thiazines, thiazepines and thiazocines. 4,376,769, Cl. 424-246.000.
Shiga, Tetsuo: *See*—
Hayashi, Yoshio; Onuma, Akira; and Shiga, Tetsuo, 4,376,816, Cl. 430-347.000.
Shimizu, Eisaku, to Kabushiki Kaisha Suwa Seikosha. Timekeeping device. 4,376,995, Cl. 368-107.000.
Shinbori, Kazuyoshi: *See*—
Furukawa, Hideo; Okamoto, Masaaki; and Shinbori, Kazuyoshi, 4,376,335, Cl. 29-447.000.
Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,376,994, Cl. 368-74.000.
Shionogi & Co., Ltd.: *See*—
Narisada, Masayuki; Okada, Tetso; Yoshida, Tadashi; and Matsuura, Shinzo, 4,376,770, Cl. 424-248.510.
Shioyama, Giichi: *See*—
Hata, Yoshitaka; and Shioyama, Giichi, 4,376,428, Cl. 123-417.000.
Shirato, Yoshiaki: *See*—
Hara, Toshitami; Sato, Yasushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,376,945, Cl. 346-140.00R.
Shomura, Takashi: *See*—
Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Kojima, Michio; Inouye, Shigeharu; and Ito, Tatsuo, 4,376,778, Cl. 424-274.000.
Showa Denko Kabushiki Kaisha: *See*—
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,376,724, Cl. 252-460.000.
Shulman, Elliott: *See*—
Osrow, Harold; and Shulman, Elliott, 4,376,624, Cl. 425-464.000.
Sicre, Jean L., to S.F.E.N.A. Variometer. 4,376,980, Cl. 364-565.000.
Sidewinder International, Ltd.: *See*—
Heilskov, Jens A., 4,376,419, Cl. 114-219.000.
Siemens Aktiengesellschaft: *See*—
Behn, Reinhard; Pachonik, Horst; and Seebacher, Gerhard, 4,376,329, Cl. 29-25.420.
Hellwig, Hubertus; Schuster, Hans-Joachim; and Heppner, Klaus-Dieter, 4,376,683, Cl. 204-15.000.
Krause, Hartmut; and Seifert, Gerd, 4,377,002, Cl. 378-093.000.
Ludwig, Volker; and Heitmann, Juergen, 4,376,988, Cl. 365-222.000.
Schoenwald, Klaus, 4,376,613, Cl. 415-53.00T.
Sigusch, Reiner, 4,376,658, Cl. 148-1.500.
Siemon, Edward C.: *See*—
Wueschinski, Russel P.; and Siemon, Edward C., 4,376,968, Cl. 363-37.000.
Sieverin, Walter J.: *See*—
Duo, Tan K.; Gold, Vance B.; Kubacki, Edward F.; and Sieverin, Walter J., 4,376,883, Cl. 219-109.000.
Sigusch, Reiner, to Siemens Aktiengesellschaft. Method of producing structures composed of photosensitive resist for integrated semiconductor circuits. 4,376,658, Cl. 148-1.500.
Simons, John R.; and Fenske, John W., to Grunau Company Co. Sprinkler head. 4,376,465, Cl. 169-39.000.
Siwko, Eric I.: *See*—
Robinson, James E.; and Siwko, Eric I., 4,376,623, Cl. 425-143.000.
Skinner, Glenn R. Downed aircraft position indicator. 4,376,421, Cl. 116-211.000.
Skjold, Arthur C.: *See*—
Rupchock, Patricia A.; and Skjold, Arthur C., 4,376,828, Cl. 436-97.000.
Skoog, Malte, to Alfa-Laval AB. Plate heat exchanger. 4,376,460, Cl. 165-167.000.
Skough, Evert B., to Mark Controls Corporation. Let-down valve. 4,376,448, Cl. 137-329.020.
Slagteriernes Forskningsinstitut: *See*—
Boas, Peter F.; and Petersen, Olfert H., 4,376,325, Cl. 17-18.000.
Sloan, Kenneth B., to Merck & Co., Inc. Pyridylmethyl esters of selected bio-affecting carboxylic acids. 4,376,767, Cl. 424-232.000.
Small, Stuart H. Waste disposal apparatus. 4,376,702, Cl. 210-201.000.
Smirra, Johannes R. Process and apparatus for producing a ring unit for the valve parts of labyrinth valves. 4,376,885, Cl. 219-121.0EC.
Smith, Kenneth L. Shielded radio frequency transmission cable. 4,376,920, Cl. 333-12.000.
Smith, Maurice R., to Metallurgical Processes Limited. Pyrometallurgical smelting of lead and copper. 4,376,754, Cl. 420-573.000.
Smith, Michael L.: *See*—
Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., 4,376,583, Cl. 356-237.000.
Smith, Wayne R.: *See*—
George, Clifford L.; and Smith, Wayne R., 4,376,529, Cl. 270-53.000.
Snamprogetti, S.p.A.: *See*—
Lagana', Vincenzo; Saviano, Francesco; and Bisi, Piero, 4,376,717, Cl. 252-376.000.
Snauwaert & Depla: *See*—
Muselet, Andre; and Muselet, Jacques, 4,376,535, Cl. 273-73.00A.
Snelling, Christopher, to Xerox Corporation. Light collector rod for use in xerographic systems. 4,376,576, Cl. 355-3.00R.
Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Horak, Edgardo; Casati, Alvaro; Bianucci, Giancarlo; Marafioti, Luigi; and Notarbartolo, Silvio, 4,376,680, Cl. 203-89.000.
Societe Asonyme Francaise du Ferodo: *See*—
Loizeau, Pierre, 4,376,477, Cl. 192-106.200.
Societe Europeenne des Produits Refractaires: *See*—
Eanoult, Marc; and Hugues, Jean-Claude, 4,376,805, Cl. 428-409.000.
Societe Metallurgique Liotard Freres: *See*—
Bouron, Pierre; Robineau, Maurice; and Thiery, Alain, 4,376,451, Cl. 137-588.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A.: *See*—
Boudigues, Serge, 4,376,375, Cl. 60-226.300.
Soe, Niels, to Pindstrup Mosebrug A/S. Apparatus for the continuous manufacture of a mixed fodder. 4,376,515, Cl. 241-101.00B.
Sofia, John W. Storage and handling system for photographic slides and the like and method. 4,376,610, Cl. 414-416.000.
Sohda, Takashi: *See*—
Kawamatsu, Yutaka; Sohda, Takashi; and Hirata, Takeo, 4,376,777, Cl. 424-270.000.
Sohn, Hong Y., to University of Utah. Process for treating sulfide-bearing ores. 4,376,647, Cl. 75-7.000.
Soininen, Pentti; and Henrichson, Olle, to Oy Wartsila Ab. Personnel air lock. 4,376,352, Cl. 49-68.000.
Solis s.r.l.: *See*—
Gazzarrini, Vinicio, 4,376,400, Cl. 83-109.000.
Solomon, Julius L.: *See*—
Sciaky, Albert M.; Farrell, William J.; and Solomon, Julius L., 4,376,886, Cl. 219-121.0ED.
Someya, Hiromi; and Momiyama, Kikuo, to Canon Kabushiki Kaisha. Single lens reflex cameras and viewfinder display switchover devices therefor. 4,376,575, Cl. 354-155.000.
Sony Corporation: *See*—
Kobayasi, Tomio; and Fukushi, Kouji, 4,376,337, Cl. 29-603.000.
Soper, William G., to United States of America, Navy. Shock simulator. 4,376,388, Cl. 73-12.000.
Sotton, Michel: *See*—
Goldman, Max; Le Fur, Daniel; and Sotton, Michel, 4,376,964, Cl. 361-233.000.
Souda, Shigeru: *See*—
Hirose, Noriyasu; and Souda, Shigeru, 4,376,780, Cl. 424-282.000.
Soussa, Alex J., to Borg-Warner Corporation. Hermetic dynamoelectric device with two-phase refrigerant cooling and sealing. 4,376,902, Cl. 310-54.000.
Spagna, Vincent A.: *See*—
Prior, Richard B.; and Spagna, Vincent A., 4,376,634, Cl. 436-502.000.
Spakowski, Paul A., to All American Fuel Systems. Supplemental fuel injection system. 4,376,433, Cl. 123-478.000.
Spani, Wayne M.: *See*—
Toth, John E.; Spani, Wayne M.; Deming, Chandler R.; and Cumo, Anthony W., 4,376,942, Cl. 346-76.0PH.
Spatz, Walter B. Device for adjusting dose dispensed. 4,376,495, Cl. 222-46.000.
Speet, Larry A.: *See*—
Vanden Hoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,376,561, Cl. 339-21.00R.
Speranza, George P.; and Zimmerman, Robert L., to Texaco Inc. Catalyst-solvent system for polyester-based polyurethane foams comprising N-butylmorpholine and N,N'-dimethylpiperazine and the solvent. 4,376,832, Cl. 521-115.000.
Sperry Corporation: *See*—
Bohman, Carl E.; Maguire, Hugh C.; and Thompson, Bradley J., 4,376,609, Cl. 414-335.000.
Karban, Steven H.; Drexler, James V.; and Hennen, Cleon L., 4,376,874, Cl. 179-15.55T.
Lahti, Archie E.; Engelbrecht, Kenneth L.; and Kalvestrand, Donald R., 4,376,976, Cl. 364-200.000.
Sprague Electric Company: *See*—
Arora, Mulk R., 4,376,686, Cl. 204-129.850.
Dunkl, Franz S., 4,376,713, Cl. 252-62.200.
Sprague, Robert A., to Xerox Corporation. Thick film line modulator. 4,376,568, Cl. 350-356.000.
Squires, Gregg W.: *See*—
Stevens, Bernard; and Squires, Gregg W., 4,376,387, Cl. 74-11.000.
Staab, Carl J., to Westinghouse Electric Corp. Automatic fault detection and recovery system which provides stability and continuity of operation in an industrial multiprocessor control. 4,377,000, Cl. 371-11.000.
Stabilimento Bioterapico Farmacologico La Farmochimica Italiana, S.p.A.: *See*—
Montanari, Roberto, 4,376,788, Cl. 424-330.000.
Stahl, Lawrence E., to Hardee's Food Systems, Inc. Cooking griddle ventilator. 4,376,434, Cl. 126-299.00D.
Stanadyne, Inc.: *See*—
Davis, Charles W., 4,376,432, Cl. 123-450.000.
Standard Oil Company (Indiana): *See*—
Allen, Neil W., 4,376,467, Cl. 175-7.000.
Pattillo, Phillip D.; and Wadlington, William H., 4,376,463, Cl. 166-285.000.
Stanfield, William G.: *See*—
Britton, Frederick G.; Stanfield, William G.; and Landers, Don B., 4,376,597, Cl. 405-195.000.

Stanley, Keith D., to Akzona Incorporated. Rate and yield enhancement in the preparation of ethoxylated quaternary ammonium borates using ethylene glycol. 4,376,736, Cl. 260-462.00R.
Stauffer Chemical Company: *See*—
Large, George B., 4,376,644, Cl. 71-87.000.
Steel Web Corporation: *See*—
Jackson, Thomas E., 4,376,362, Cl. 52-639.000.
Steelcase Inc.: *See*—
Vanden Hoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,376,561, Cl. 339-21.00R.
Steiger, Rolf; and Reber, Jean F., to Ciba-Geigy AG. Direct-positive photographic material. 4,376,817, Cl. 430-578.000.
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; and Teschendorf, Hans-Juergen, to BASF Aktiengesellschaft. 10-Substituted 5-cyanomethylene-10,11-dihydro-dibenzo-[a,d]-cycloheptenes, their preparation, and therapeutic agents containing these compounds. 4,376,773, Cl. 424-251.000.
Stendel, Wilhelm: *See*—
Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,376,786, Cl. 424-304.000.
Stenzel, Hans-Dieter, to Kabel-und Metallwerke Gutehoffnungshuette AG. Method and apparatus for continuously extruding an expandable thermoplastic resin composition onto an elongated preform. 4,376,741, Cl. 264-45.900.
Sterling Drug Inc.: *See*—
Crounse, Nathan N., 4,376,729, Cl. 260-197.000.
Lesher, George Y.; and Page, Donald F., 4,376,775, Cl. 424-263.000.
Stevens, Bernard; and Squires, Gregg W., to Products and Patents Ltd. Dynamic shock absorber evaluator. 4,376,387, Cl. 74-11.000.
Stewart, John W.; Woelk, Darrell W.; and DeForest, Marvin R., to NCR Corporation. Associative memory system. 4,376,974, Cl. 364-200.000.
Stewart & Stevenson Services, Inc.: *See*—
Mondy, Clement R., Jr., 4,376,443, Cl. 134-168.00R.
Stig Ravn A/S: *See*—
Ostergaard, Steen, 4,376,499, Cl. 222-339.000.
Stinton, David P.: *See*—
Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., 4,376,792, Cl. 427-6.000.
Stiso, Sisto N.; and White-Stevens, Rodric H., to Miles Laboratories, Inc. Composition, test device and method for determining the ionic strength or specific gravity of a liquid sample utilizing a strong polyelectrolyte. 4,376,827, Cl. 436-2.000.
Stopinc Aktiengesellschaft: *See*—
Hafner, Alfred; and Muschner, Udo, 4,376,501, Cl. 222-600.000.
Stotz, Manfred: *See*—
Bartel, Gunter; Fiedler, Horst; Stotz, Manfred; and Kleinschmit, Einhard, 4,376,492, Cl. 220-210.000.
Strang, Robert: *See*—
Jenkner, Herbert; and Strang, Robert, 4,376,837, Cl. 524-108.000.
Straube, Franz A.; and Lehnert, Gunther, to Bayer Aktiengesellschaft. Method of producing a supporting bandage and bandaging material suitable for this purpose. 4,376,438, Cl. 128-90.000.
Strauss, J. Gerrold, to PACCAR Inc. Vehicle canopy. 4,376,550, Cl. 296-102.000.
Subramanyam, Arty R. T.; and Schroder, Manfred, to Lackwerke Wulfing GmbH & Co. Water dilutable cathodic depositable resinous binder production and use. 4,376,848, Cl. 525-452.000.
Sugasawa, Fukashi: *See*—
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,376,426, Cl. 123-198.00F.
Sugimoto, Koichi: *See*—
Takeda, Kazutoshi; and Sugimoto, Koichi, 4,376,810, Cl. 429-90.000.
Sugimoto, Osamu; and Akagawa, Masaki, to Kabushiki Kaisha Nippon Coinco. Control device for a vending machine including system for confirming vendibility of selected articles. 4,376,478, Cl. 194-1.00N.
Sugimoto, Osamu; and Akagawa, Masaki, to Kabushiki Kaisha Nippon Coinco. Total sales indication device for a vending machine. 4,376,479, Cl. 194-1.00N.
Sugo, Takanobu: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.
Sullivan, William E., to Risdon Enterprises, Inc. Device for holding and dispensing a fluid substance and method for making same. 4,376,483, Cl. 206-484.000.
Sulzer Brothers Limited: *See*—
Wynn, Nicholas P.; and Zabelka, Michal, 4,376,653, Cl. 106-103.000.
Sumitomo Chemical Co., Limited: *See*—
Fujita, Fumio, 4,376,871, Cl. 568-366.000.
Matsuo, Noritada; and Hirano, Masachika, 4,376,785, Cl. 424-304.000.
Sundheim, Benson R.; Grady, Richard F.; and Brumlik, George C. Topical environmental device. 4,376,437, Cl. 128-82.100.
Sung, Rodney L., to Texaco Inc. Novel gasohol or ethanol fuel composition containing as a corrosion inhibitor the reaction product of benzothiazole, formaldehyde and an N-alkyl propylene diamine. 4,376,635, Cl. 44-56.000.
Sussman, Milton H., to Warner Lambert Technologies, Inc. Microscope objective. 4,376,570, Cl. 350-414.000.
Suzuki, Kouichirou: *See*—
Torii, Michihiro; Moritomo, Takao; Suzuki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, 4,376,961, Cl. 360-106.000.
Suzuki, Tetsuya: *See*—
Torii, Michihiro; Moritomo, Takao; Suzuki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, 4,376,961, Cl. 360-106.000.
Svenningsen, Ole N., to Volund Vaskerimaskiner A/S. Heat exchanger. 4,376,378, Cl. 68-16.000.
Swetly, Peter: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,376,760, Cl. 424-1.500.
Swift, David W., to Pilkington P.E. Limited. Low light level vision apparatus. 4,376,889, Cl. 250-213.0VT.
Swiss Aluminium Ltd.: *See*—
Kugler, Tibor, 4,376,690, Cl. 204-243.00R.
Systems Research Laboratories, Inc.: *See*—
Mah, Tai-Il, 4,376,742, Cl. 264-85.000.
Syva Company: *See*—
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,376,825, Cl. 435-188.000.
Szilagyi, Imre; and Alexander, Steven, to ILC Technology, Inc. Electrode ribbon seal assembly. 4,376,906, Cl. 313-332.000.
Tacchi, Victorio. Household hot water systems. 4,376,436, Cl. 126-437.000.
Tagami, Katsutoshi; and Tuchiya, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Automatic light control for automotive vehicles. 4,376,909, Cl. 315-82.000.
Taisan Industrial Co., Ltd.: *See*—
Toyoda, Akira; Arima, Shizuo; Nozawa, Katsumi; and Igarashi, Kenji, 4,376,618, Cl. 417-417.000.
Takada, Shigetaka; and Watanabe, Yukihiro, to Aisan Industry Co., Ltd. Air-fuel mixture ratio control device. 4,376,430, Cl. 123-438.000.
Takahashi, Hiroshi: *See*—
Komatu, Satoru; Kobane, Sumio; Yamamoto, Masanobu; Takahashi, Hiroshi; and Izumo, Terutsugu, 4,376,931, Cl. 340-58.000.
Takaishi, Yukio: *See*—
Takeda, Nobuhiro; Mizuno, Shigeo; Takaishi, Yukio; and Hattori, Masaichi, 4,376,896, Cl. 307-115.000.
Takashima & Co., Ltd.: *See*—
Hara, Hidetada, 4,376,466, Cl. 169-53.000.
Takashio, Masachika: *See*—
Okami, Yoshiro; Yamada, Kazuhiko; and Takashio, Masachika, 4,376,761, Cl. 424-48.000.
Takatori, Yasushi: *See*—
Hara, Toshitami; Sato, Yasushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,376,945, Cl. 346-140.00R.
Takechi, Hiroshi; Matsuo, Munetsugu; and Koyama, Kazuo, to Nippon Steel Corporation. Method of producing dual phase structure cold rolled steel sheet. 4,376,661, Cl. 148-12.00C.
Takeda Chemical Industries, Ltd.: *See*—
Kawamatsu, Yutaka; Sohda, Takashi; and Hirata, Takeo, 4,376,777, Cl. 424-270.000.
Takeda, Kazutoshi; and Sugimoto, Koichi, to Kabushiki Kaisha Daini Seikosha. Alkaline cell. 4,376,810, Cl. 429-90.000.
Takeda, Kunihiko: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, 4,376,687, Cl. 204-181.00C.
Takeda, Nobuhiro; Mizuno, Shigeo; Takaishi, Yukio; and Hattori, Masaichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switching assembly. 4,376,896, Cl. 307-115.000.
Takeda, Reiji; and Oikawa, Shozo, to Nippon Tensaiseito Kabushiki Kaisha. Method for optical determination of saturation temperature and apparatus therefor. 4,377,001, Cl. 374-17.000.
Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor dynamic memory. 4,376,989, Cl. 365-230.000.
Takemura, Yasuhiko: *See*—
Kotani, Teizo; Enyo, Hiroji; Watanabe, Masaaki; and Takemura, Yasuhiko, 4,376,846, Cl. 525-205.000.
Takeshita, Shigeru: *See*—
Kinugasa, Haruo; Hase, Koujirou; Takeshita, Shigeru; and Mizue, Masao, 4,376,370, Cl. 60-337.000.
Takitani, Keiichiro: *See*—
Ohshimatani, Toshio; Mimura, Yukihiro; Nozawa, Kengo; Maguchi, Tatsuo; and Takitani, Keiichiro, 4,376,528, Cl. 266-114.000.
Tanaka, Chiaki; and Nakashima, Shinobu, to Toray Industries, Inc. Polyether-ester amide and process for preparation thereof. 4,376,856, Cl. 528-292.000.
Tanaka, Susumu; and Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Electrographic copying machine of powder image transfer type. 4,376,578, Cl. 355-15.000.
Taniguchi, Shoji: *See*—
Horino, Shigeo; Taniguchi, Shoji; and Omura, Hideo, 4,376,364, Cl. 53-54.000.
Tanso, Shiro: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.
Tatsumi, Hideo: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tohkairin, Akira; and Tatsumi, Hideo, 4,376,333, Cl. 29-432.000.
Tax, Hans; and Hösler, Klaus, to Tax, Hans. System for loading liquids. 4,376,452, Cl. 137-615.000.
Taylor, John C. Switch units for electric immersion heaters. 4,376,925, Cl. 337-36.000.

TDC Technology Development Corporation: *See*—
Fawcett, William R.; and Baranski, Andrzej S., 4,376,682, Cl. 204-14.00N.
TDK Electronics Co., Ltd.: *See*—
Ishida, Toshihiko; Azegami, Hitoshi; and Kawakami, Yoshio, 4,376,519, Cl. 242-199.000.
Technicon Instruments Corporation: *See*—
Malin, Miachael J., 4,376,839, Cl. 524-303.000.
Teepak, Inc.: *See*—
Martinek, Harold H., 4,376,592, Cl. 403-26.000.
Teledyne Industries, Inc.: *See*—
McGinness, Robert L., 4,376,650, Cl. 75-129.000.
Tellez, Charles E.: *See*—
Duron, Paul P.; Tellez, Charles E.; and Lutjens, Robert D., 4,376,377, Cl. 62-55.500.
Tencor Instruments: *See*—
Wheeler, William R.; Kren, George J.; and Clementson, David D., 4,376,482, Cl. 198-394.000.
Tenneco Chemicals, Inc.: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,376,719, Cl. 252-426.000.
Teramachi, Hiroshi. Linear ball bearing. 4,376,557, Cl. 308-6.00C.
Teschendorf, Hans-Juergen: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; and Teschendorf, Hans-Juergen, 4,376,773, Cl. 424-251.000.
Texaco Inc.: *See*—
Speranza, George P.; and Zimmerman, Robert L., 4,376,832, Cl. 521-115.000.
Sung, Rodney L., 4,376,635, Cl. 44-56.000.
Texas Instruments Incorporated: *See*—
Castro, Carlos A., 4,376,659, Cl. 148-1.500.
Chiu, Te-Long; and Lien, Jih-Chang, 4,376,947, Cl. 357-23.000.
Senor, Ronald E., 4,376,926, Cl. 337-104.000.
Tsaur, Shyh-Chang; and Kuo, Chang-Kiang, 4,376,983, Cl. 365-53.000.
Thermco Products Corporation: *See*—
Arrasmith, Robert D.; Barnhart, Thomas R.; and Goldman, Jon C., 4,376,796, Cl. 427-82.000.
Thierrichter, Burkhard: *See*—
Junek, Hans; and Thierrichter, Burkhard, 4,376,862, Cl. 548-249.000.
Thiery, Alain: *See*—
Bouron, Pierre; Robineau, Maurice; and Thiery, Alain, 4,376,451, Cl. 137-588.000.
Thiessen, Albert R.: *See*—
Nuckolls, John H.; Thiessen, Albert R.; and Dahlbacka, Glen H., 4,376,752, Cl. 376-152.000.
Thompson, Bradley J.: *See*—
Bohman, Carl E.; Maguire, Hugh C.; and Thompson, Bradley J., 4,376,609, Cl. 414-335.000.
Thompson, Marion E. Light powered mobile. 4,376,347, Cl. 40-441.000.
Thomsen, Jack W., to Weckesser Co. Inc. Captive standoff bushing. 4,376,605, Cl. 411-112.000.
Thomson-CSF: *See*—
Cohen, Georges, 4,376,937, Cl. 343-16.00M.
Curtinot, Jean C.; Delestre, Xavier; and Fouillet, Jean, 4,376,923, Cl. 333-232.000.
Thyes, Marco: *See*—
Lebkuecher, Rolf; Thyes, Marco; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Lenke, Dieter; and Kunze, Johannes, 4,376,771, Cl. 424-250.000.
Tieszen, Dwayne A., to Vista Manufacturing, Inc. Strip lights and method of making same. 4,376,966, Cl. 362-249.000.
Tillmann, Horst, to Dorma-Baubeschlag GmbH & Co. KG. Automatic door closer. 4,376,323, Cl. 16-51.000.
Timex Corporation: *See*—
Wuthrich, Paul, 4,376,996, Cl. 368-220.000.
Titan Kogyo K.K.: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, 4,376,656, Cl. 106-309.000.
Tohkairin, Akira: *See*—
Kanamaru, Hisanobu; Okabe, Moisei; Tohkairin, Akira; and Tatsumi, Hideo, 4,376,333, Cl. 29-432.000.
Tokuda, Masahiro: *See*—
Ohtawa, Kimiaki; Tokuda, Masahiro; and Fukada, Yasuo, 4,376,648, Cl. 75-35.000.
Tokyo Electric Co., Ltd.: *See*—
Fujisawa, Tadao, 4,376,586, Cl. 400-229.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Endo, Norio; and Iizuka, Hisakazu, 4,376,336, Cl. 29-571.000.
Horino, Shigeo; Taniguchi, Shoji; and Omura, Hideo, 4,376,364, Cl. 53-54.000.
Masuda, Eiji; and Sakamoto, Shigemi, 4,376,918, Cl. 331-116.0FE.
Okamoto, Katsuhiko, 4,376,577, Cl. 355-3.0DR.
Wakao, Nobutaka, 4,376,579, Cl. 355-3.0DR.
Tomalia, Donald A.: *See*—
Lalk, James W.; Kolb, Gerald C.; Tomalia, Donald A.; and Owen, Peter W., 4,376,861, Cl. 548-237.000.
Tomasek, Donald J.; and McCash, Benjamin L., to International Harvester Co. Multipie clutch control system. 4,376,473, Cl. 192-3.580.
Toray Industries, Inc.: *See*—
Tanaka, Chiaki; and Nakashima, Shinobu, 4,376,856, Cl. 528-292.000.
Torelli, Vesperto; and Nedelec, Lucien, to Roussel Uclaf. Process for 3-amino-steroid preparation. 4,376,734, Cl. 260-397.300.
Torii, Michihiro; Moritomo, Takao; Suzaki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, to Fuji Electrochemical Co., Ltd. Magnetic drum/head system for selectively generating recorded voice information. 4,376,961, Cl. 360-106.000.
Toriyama, Akio: *See*—
Fujimoto, Tadao; Kawasugi, Tadaaki; Madokoro, Taketoshi; and Toriyama, Akio, 4,376,701, Cl. 210-96.100.
Toro Company, The: *See*—
Hagar, Jay L., 4,376,513, Cl. 239-231.000.
Hampel, Wilbur J.; and Loun, Dana R., 4,376,630, Cl. 464-88.000.
Toth, John E.; Spani, Wayne M.; Deming, Chandler R.; and Cumo, Anthony W., to Cubic Western Data. Thermal printing system. 4,376,942, Cl. 346-76.0PH.
Toth, John F.; Conti, Richard J.; Cavallaro, Nunzio M.; and Dowling, Thomas B., to Raytheon Company. Wire grid microstrip antenna. 4,376,938, Cl. 343-700.0MS.
Toyo Kogyo Co., Ltd.: *See*—
Yokooku, Katsuhiko; and Iida, Katsuyoshi, 4,376,431, Cl. 123-440.000.
Toyoda, Akira; Arima, Shizuo; Nozawa, Katsumi; and Igarashi, Kenji, to Taisan Industrial Co., Ltd. Electromagnetic plunger pump. 4,376,618, Cl. 417-417.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Horikoshi, Masafumi; Sato, Michikatsu; and Onishi, Takanori, 4,376,369, Cl. 60-276.000.
Mizuno, Kisaburo, 4,376,427, Cl. 123-339.000.
Okano, Hiroshi; and Yamazaki, Masami, 4,376,617, Cl. 417-407.000.
Troiano, Anthony, to RCA Corporation. Noise responsive automatic peaking control apparatus. 4,376,952, Cl. 358-166.000.
Trouet, Andre B. L.; Masquelier, Michele M. L. G.; and Baurain, Roger M., to Institut International de Pathologie Cellulaire et Moleculaire. Medicaments, their preparation and compositions containing same. 4,376,765, Cl. 424-177.000.
Tsaur, Shyh-Chang; and Kuo, Chang-Kiang, to Texas Instruments Incorporated. High density dynamic memory cell. 4,376,983, Cl. 365-53.000.
Tsuchikane, Yoshiyuki: *See*—
Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, 4,376,959, Cl. 360-72.200.
Tsukada, Tsutomu; and Ukai, Katsumi, to Anelva Corporation. Dry etching device comprising a member for bringing a specimen into electrical contact with a grounded electrode. 4,376,692, Cl. 204-298.000.
Tsuyama, Shigeo: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,376,720, Cl. 252-430.000.
Tuchiya, Yoshikazu: *See*—
Tagami, Katsutoshi; and Tuchiya, Yoshikazu, 4,376,909, Cl. 315-82.000.
Tunnell, James H.; and Piper, Hugh V., to Caterpillar Tractor Co. Automatic brake speed bleed system. 4,376,474, Cl. 192-4.00A.
Turkevich, John; and Burchenal, Joseph H., to Research Corporation. Complexes of square planar platinum II compounds and N-methyl glucamine. 4,376,782, Cl. 424-287.000.
Tusim, Martin H., to Dow Chemical Company, The. Quiet film and container. 4,376,799, Cl. 428-213.000.
Uchino, Hideo; Nomura, Masami; Aoi, Takaaki; and Kanbe, Masumi, to Mitsubishi Denki Kabushiki Kaisha. Emergency apparatus for elevator. 4,376,471, Cl. 187-29.00R.
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tsutomu, to National Research Institute for Metals. Process for production fine metal particles. 4,376,740, Cl. 264-10.000.
Uenishi, Toshiaki: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, 4,376,656, Cl. 106-309.000.
Ueno, Kouji: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,376,984, Cl. 365-104.000.
Ukai, Katsumi: *See*—
Tsukada, Tsutomu; and Ukai, Katsumi, 4,376,692, Cl. 204-298.000.
Ullman, Edwin F.: *See*—
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,376,825, Cl. 435-188.000.
UMC Industries, Inc.: *See*—
Chumley, Calvin L., 4,376,447, Cl. 137-244.000.
Union Carbide Corporation: *See*—
Nazem, Faramarz, 4,376,747, Cl. 264-176.00F.
United Aircraft Products, Inc.: *See*—
Haushalter, Frederick W.; and Lord, Thomas J., 4,376,619, Cl. 417-540.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Chivers, Howard R., 4,376,973, Cl. 364-200.000.
United States Gypsum Company: *See*—
Ali, Mohammad H., 4,376,674, Cl. 162-136.000.
Michael, Ralph E., 4,376,361, Cl. 52-241.000.
United States of America
Agriculture: *See*—
Reinhardt, Robert M.; and Daigle, Donald J., 4,376,633, Cl. 8-184.000.
Air Force: *See*—
Kaiser, Robert, 4,376,716, Cl. 252-309.000.
Army: *See*—
Chaffee, Edwin G., 4,376,908, Cl. 315-39.300.

Madderra, Jimmy M., 4,376,405, Cl. 89-1.806.
Wang, Cheng-Chi; and Chu, Muren, 4,376,663, Cl. 148-171.000.
Williams, Leroy J., Jr., 4,376,666, Cl. 149-109.600.

Energy: *See*—
Angelini, Peter; Lackey, Walter J.; Stinton, David P.; Blanco, Raymond E.; Bond, Walter D.; and Arnold, Wesley D., Jr., 4,376,792, Cl. 427-6.000.
Beitel, George A., 4,376,392, Cl. 73-864.450.
Brouns, Richard A.; Buelt, James L.; and Bonner, William F., 4,376,598, Cl. 405-258.000.
Brown, Robert L.; and Kenney, Walter J., 4,376,384, Cl. 72-135.000.
Duchane, David V., 4,376,751, Cl. 264-341.000.
Elliott, Guy R. B.; Barraclough, Bruce L.; and Vanderborgh, Nicholas E., 4,376,462, Cl. 166-267.000.
Kirchner, Tommy L.; and Powers, Hurshal G., 4,376,582, Cl. 356-71.000.
Marcellis, Alphonso W.; and Grelecki, Chester J., 4,376,665, Cl. 149-22.000.
Narayan, Jagdish; and Chen, Yok, 4,376,755, Cl. 423-275.000.
Nuckolls, John H.; Thiessen, Albert R.; and Dahlbacka, Glen H., 4,376,752, Cl. 376-152.000.
Pettibone, Joseph S.; and Wheeler, Paul C., 4,376,901, Cl. 310-10.000.

National Aeronautics and Space Administration: *See*—
Evans, John C.; Chai, An-Ti; and Goradia, Chandra P., 4,376,872, Cl. 136-249.000.

Navy: *See*—
Black, William L., 4,376,406, Cl. 89-7.000.
Ganguly, Achintya K.; Davis, Kenneth L.; and Chu, Kwo R., 4,376,917, Cl. 331-94.100.
Soper, William G., 4,376,388, Cl. 73-12.000.
Zenel, Joseph A., 4,376,941, Cl. 343-709.000.

U.S. Philips Corporation: *See*—
Bruinshorst, Berend T. J., 4,376,977, Cl. 364-200.000.
Gijzen, Wilhelmus A. H., 4,376,572, Cl. 350-486.000.
Himmelbauer, Erich E., 4,376,907, Cl. 313-389.000.
Versteeg, Gijsbert W.; Phillips, Ian; and Enggrav, Eilev, 4,376,876, Cl. 179-77.000.
Vogler, Gerd, 4,376,894, Cl. 378-110.000.
Wassink, Derk J. C., 4,377,004, Cl. 455-176.000.

United Technologies Corporation: *See*—
Fowler, Donald W.; and Arifian, Kenneth C., 4,376,979, Cl. 364-424.000.

University of Utah: *See*—
Sohn, Hong Y., 4,376,647, Cl. 75-7.000.

Upjohn Company, The: *See*—
Goldwasser, David J.; and Onder, Kemal, 4,376,834, Cl. 521-159.000.

Uy, James C.: *See*—
Knoop, Jack P.; Weiss, Joel R.; and Uy, James C., 4,376,963, Cl. 360-135.000.

Valdiserri, Leo L.; and Woodbury, Richard P., to Borg-Warner Corporation. Phosphite-isocyanurate oligomers. 4,376,857, Cl. 544-214.000.

Vanden Hoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., to Steelcase Inc. Panel wiring system. 4,376,561, Cl. 339-21.00R.

Vanderborgh, Nicholas E.: *See*—
Elliott, Guy R. B.; Barraclough, Bruce L.; and Vanderborgh, Nicholas E., 4,376,462, Cl. 166-267.000.

Vander Neut, Richard D.: *See*—
Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., 4,376,583, Cl. 356-237.000.

van Erven, Walterus J. Method and apparatus for forming a plate with at least one profiled border. 4,376,748, Cl. 264-255.000.

Vangermain, Erwin; and Mengler, Claus-Dieter, to Chemische Werke Huls A.G. Process for activating or reactivating ethylene oxide silver substrate catalysts. 4,376,718, Cl. 252-416.000.

Van Soest, Cornelius J. M.; Muller, Rostislav; and Bagaric, Stjepan, to Harnischfeger Corp. of Canada Ltd. Anti-sway, anti-rotation mechanism for crane reeving. 4,376,487, Cl. 212-147.000.

Verity, Nigel C., to Biotech Electronics Ltd. Portable air cleaner unit. 4,376,642, Cl. 55-105.000.

Versteeg, Gijsbert W.; Phillips, Ian; and Enggrav, Eilev, to U.S. Philips Corporation. DC Supply for an electronic signalling device. 4,376,876, Cl. 179-77.000.

Victor Company of Japan, Limited: *See*—
Mori, Toshinori; Tsuchikane, Yoshiyuki; and Matsushige, Takashi, 4,376,959, Cl. 360-72.200.

Victor, James. Microcircuit cover remover. 4,376,399, Cl. 83-13.000.

Vista Manufacturing, Inc.: *See*—
Tieszen, Dwayne A., 4,376,966, Cl. 362-249.000.

VLSI Technology Research Association: *See*—
Nagasawa, Kazutoshi; Kishino, Seigo; Matsushita, Yoshiaki; and Kanamori, Masaru, 4,376,657, Cl. 148-1.500.

Vo, Toan P., to Calgon Corporation. Novel repressurization of pressure swing adsorption system. 4,376,639, Cl. 55-26.000.

Vo, Toan P., to Calgon Corporation. Repressurization of pressure swing adsorption system. 4,376,640, Cl. 55-26.000.

Vogler, Gerd, to U.S. Philips Corporation. Device for driving a rotary-anode X-ray tube. 4,376,894, Cl. 378-110.000.

Vogt, Wilhelm: *See*—
Englaender, Fritz; El-Chahawi, Moustafa; and Vogt, Wilhelm, 4,376,866, Cl. 560-60.000.

Volmer, David W.: *See*—
Novak, W. Thomas; and Volmer, David W., 4,376,580, Cl. 355-52.000.

Voland Vaskerimaskiner A/S: *See*—
Svenningsen, Ole N., 4,376,378, Cl. 68-16.000.

Vyzkumny ustav keramiky: *See*—
Lanik, Igor; Havelka, Otakar; and Pirochta, Dusan, 4,376,651, Cl. 106-38.240.

Wadlington, William H.: *See*—
Pattillo, Phillip D.; and Wadlington, William H., 4,376,463, Cl. 166-285.000.

Wakahata, Tamotsu: *See*—
Sakaira, Tadashi; Yamada, Hideyuki; and Wakahata, Tamotsu, 4,376,726, Cl. 252-519.000.

Wakao, Nobutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic copying apparatus having an easily removable photosensitive drum. 4,376,579, Cl. 355-3.0DR.

Walatka, Vernon V., Jr.: *See*—
Himmenkamp, James A.; and Walatka, Vernon V., Jr., 4,376,757, Cl. 423-332.000.

Walls, John E., to American Hoechst Corporation. Ceramic deposition on aluminum. 4,376,814, Cl. 430-272.000.

Walter, Wilhelm; and Dreschmann, Peter, to FAG Kugelfischer Georg Schafer & Co. Axially and radially effective bearing seal. 4,376,541, Cl. 277-153.000.

Walters, Max. Glass shelf support. 4,376,521, Cl. 248-206.00R.

Wang, Cheng-Chi; and Chu, Muren, to United States of America, Army. Method for growing an epitaxial layer of CdTe on an epitaxial layer of HgCdTe grown on a CdTe substrate. 4,376,663, Cl. 148-171.000.

Wang, David N.; Egitto, Frank D.; and Maydan, Dan, to Applied Materials, Inc. Materials and methods for plasma etching of oxides and nitrides of silicon. 4,376,672, Cl. 156-643.000.

Ward, John; Austin, Robert; and Genovese, Anthony, to Ametek, Inc. Formation of hollow tapered brush bristles. 4,376,746, Cl. 264-167.000.

Warner Lambert Company: *See*—
Colbry, Norman L., 4,376,858, Cl. 544-291.000.

Warner Lambert Technologies, Inc.: *See*—
Sussman, Milton H., 4,376,570, Cl. 350-414.000.

Warren, Joseph R.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,376,981, Cl. 364-570.000.

Warzel, F. Morgan, to Phillips Petroleum Company. Solid liquid extraction. 4,376,693, Cl. 208-11.0LE.

Washecheck, Paul H.: *See*—
Nield, Gerald L.; Yang, Kang; and Washecheck, Paul H., 4,376,868, Cl. 562-465.000.

Washington State University Research Foundation: *See*—
Johns, William E., 4,376,745, Cl. 264-109.000.

Wassink, Derk J. C., to U.S. Philips Corporation. Setting circuit. 4,377,004, Cl. 455-176.000.

Watanabe, Masaaki: *See*—
Kotani, Teizo; Enyo, Hiroji; Watanabe, Masaaki; and Takemura, Yasuhiko, 4,376,846, Cl. 525-205.000.

Watanabe, Yukihiro: *See*—
Takada, Shigetaka; and Watanabe, Yukihiro, 4,376,430, Cl. 123-438.000.

Watson, Angus, to M&T Chemicals Inc. Acid copper electroplating baths containing brightening and leveling additives. 4,376,685, Cl. 204-52.00R.

Weaver, Harry R.: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan, 4,376,339, Cl. 29-876.000.

Weber, Leon, to SCM Corporation. Production of an optically efficient titanium slurry. 4,376,655, Cl. 106-300.000.

Weber, Roy; and Huddleston, Bruce C. Energy recovery system. 4,376,373, Cl. 60-648.000.

Weckesser Co. Inc.: *See*—
Thomsen, Jack W., 4,376,605, Cl. 411-112.000.

Weidinger, Hans; Ehm, Werner; and Pav, Josef, to Kleinwefers GmbH. Flexure-resistant calender roll. 4,376,330, Cl. 29-116.0AD.

Weinberger, Theodor, to Adriel Energy Corporation. Fuel additive. 4,376,636, Cl. 44-56.000.

Weisblum, Bernard, to Wisconsin Alumni Research Foundation. Method of increasing the antibiotic yield of producing organisms. 4,376,823, Cl. 435-73.000.

Weiss, Joel R.: *See*—
Knoop, Jack P.; Weiss, Joel R.; and Uy, James C., 4,376,963, Cl. 360-135.000.

Wentcroft Engineers Limited: *See*—
Franklin, Kenneth W., 4,376,481, Cl. 198-382.000.

West, Wilbur W., to Formica Corporation. Three color high pressure decorative laminate having registered color and embossing. 4,376,812, Cl. 428-165.000.

Westcott, Gerald R.: *See*—
Carrington, James E.; and Westcott, Gerald R., 4,376,411, Cl. 101-93.140.

Western Electric Co., Inc.: *See*—
Wojcik, Thaddeus, 4,376,505, Cl. 228-215.000.

Westinghouse Electric Corp.: *See*—
Colston, John R., 4,376,620, Cl. 418-79.000.
Dickens, Lawrence E.; and Mountcastle, Paul H., 4,376,921, Cl. 333-116.000.
Hummert, George T.; and McNab, Ian R., 4,376,615, Cl. 417-50.000.

Staab, Carl J., 4,377,000, Cl. 371-11.000.

Westlake, Vincent H.: *See*—
Scott, Terrence L; Westlake, Vincent H.; and Bridle, Michael K., 4,376,706, Cl. 210-678.000.

Westphal, Teddy M., to Boise Cascade Corporation. Seam release strip composite container. 4,376,506, Cl. 229-5.600.

Wetherington, Nelson A. Bag stand. 4,376,520, Cl. 248-97.000.

Whatman Reeve Angel Limited: *See*—
Perrotta, Kenneth A., 4,376,675, Cl. 162-145.000.

Wheeler, Paul C.: *See*—
Pettibone, Joseph S.; and Wheeler, Paul C., 4,376,901, Cl. 310-10.000.

Wheeler, William R.; Kren, George J.; and Clementson, David D., to Teacor Instruments. Wafer orientation system. 4,376,482, Cl. 198-394.000.

Whetten, Nathan R., to General Electric Company. Ion chamber array with reduced dead space. 4,376,893, Cl. 250-374.000.

White, Henry J.; and Eaves, Bradford W. Method and apparatus for drying bagasse. 4,376,343, Cl. 34-109.000.

White-Stevens, Rodric H.: *See*—
Stiso, Sisto N.; and White-Stevens, Rodric H., 4,376,827, Cl. 436-2.000.

Whitehead, Gareth D. J.; and Gardner, Thomas H. Animal bedding material. 4,376,422, Cl. 119-1.000.

Whitehead, Howard A.; Roeder, Robert J.; and Grube, Herbert E., to Kimberly-Clark Corporation. Sanitary napkin with adhesive attachment means. 4,376,440, Cl. 604-387.000.

Wickham, Thomas J., to Magnetic Peripherals Inc. Apparatus for aligning and press-fitting connector terminals into a substrate. 4,376,338, Cl. 29-741.000.

Wiezer, Hartmut; and Pfahler, Gerhard, to Hoechst Aktiengesellschaft. Triazylaminotriazines, their preparation and their use for stabilizing synthetic polymers. 4,376,836, Cl. 524-100.000.

Wilkes, James L.: *See*—
Alford, W. Jerry; Cushing, Charles J.; Hunt, James D.; Smith, Michael L.; Vander Neut, Richard D.; and Wilkes, James L., 4,376,583, Cl. 356-237.000.

Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Device for sewing workpiece plies together in contour alignment. 4,376,415, Cl. 112-121.110.

Williams, James J., Jr.: *See*—
Dischert, Robert A.; Williams, James J., Jr.; and Reitmeier, Glenn A., 4,376,948, Cl. 358-13.000.

Williams, Leroy J., Jr., to United States of America, Army. Process for the recovery of carborane from reject propellant. 4,376,666, Cl. 149-109.600.

Wilson, David B., to Milliken Research Corporation. Method to measure yarn tension. 4,376,368, Cl. 57-264.000.

Winckowski, Reinhold: *See*—
Otte, Wilhelm; and Winckowski, Reinhold, 4,376,704, Cl. 210-326.000.

Wisconsin Alumni Research Foundation: *See*—
Weisblum, Bernard, 4,376,823, Cl. 435-73.000.

Wissman, Terry L.; and Schoch, Daniel A., to Minster Machine Company, The. Press guide structure. 4,376,410, Cl. 100-214.000.

Woelfel, James A., to Motor Wheel Corporation. Fiber-reinforced composite wheel construction. 4,376,749, Cl. 264-258.000.

Woelk, Darrell W.: *See*—
Stewart, John W.; Woelk, Darrell W.; and DeForest, Marvin R., 4,376,974, Cl. 364-200.000.

Wojcik, Thaddeus, to Western Electric Co., Inc. Methods for applying solder to an article. 4,376,505, Cl. 228-215.000.

Wolf, Theo: *See*—
Gunschmann, Peter; and Wolf, Theo, 4,376,962, Cl. 360-130.320.

Wolfe, David L.; and Corson, Frederick P., to Dow Chemical Company, The. Vicinal alkylene oxide polymerization and catalysts thereof. 4,376,723, Cl. 252-431.00N.

Wolfe, Norman G.: *See*—
Cannon, Dickson Y.; and Wolfe, Norman G., 4,376,807, Cl. 428-528.000.

Wolff, Per: *See*—
Jansen, Gert; and Wolff, Per, 4,376,867, Cl. 562-424.000.

Wolter, Heinz. Coupling member for the suspension of a key ring. 4,376,383, Cl. 70-456.00R.

Woo, Gar L., to Chevron Research Company. Phosphoric acid treated sulfur cement-aggregate compositions. 4,376,811, Cl. 501-140.000.

Woodbury, Richard P.: *See*—
Valdiserri, Leo L.; and Woodbury, Richard P., 4,376,857, Cl. 544-214.000.

Woodruff, Frank, to Bendix Corporation, The. Propeller brake for a turbo-prop engine. 4,376,614, Cl. 416-32.000.

Wuerzer, Bruno: *See*—
Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, 4,376,645, Cl. 71-105.000.

Wueschinski, Russel P.; and Siemon, Edward C., to Borg-Warner Corporation. Protection system for immunizing an inverter system against A-C line voltage disturbances. 4,376,968, Cl. 363-37.000.

Wuthrich, Paul, to Timex Corporation. Thin stepping motor watch. 4,376,996, Cl. 368-220.000.

Wynn, Nicholas P.; and Zabelka, Michal, to Sulzer Brothers Limited. Process for the production of nickel, high-purity magnesium oxide and cement. 4,376,653, Cl. 106-103.000.

Xerox Corporation: *See*—
Ceasar, Gerald P.; and Grimshaw, Scott F., 4,376,688, Cl. 204-192.00S.

George, Clifford L.; and Smith, Wayne R., 4,376,529, Cl. 270-53.000.

Saran, Amitabh; Luzio, Guillermo F.; and Betron, Frank A., 4,376,933, Cl. 340-347.0DD.

Snelling, Christopher, 4,376,576, Cl. 355-3.00R.

Sprague, Robert A., 4,376,568, Cl. 350-356.000.

Yamada, Hideyuki: *See*—
Sakaira, Tadashi; Yamada, Hideyuki; and Wakahata, Tamotsu, 4,376,726, Cl. 252-519.000.

Yamada, Kazuhiko: *See*—
Okami, Yoshiro; Yamada, Kazuhiko; and Takashio, Masachika, 4,376,761, Cl. 424-48.000.

Yamaguchi, Toyohiko; Kashima, Koichi; and Kaifu, Nobuo, to Hodogaya Chemical Co., Ltd. Process for preparing resorcinol copolymers. 4,376,854, Cl. 528-137.000.

Yamamoto, Masanobu: *See*—
Komatu, Satoru; Kobane, Sumio; Yamamoto, Masanobu; Takahashi, Hiroshi; and Izumo, Terutsugu, 4,376,931, Cl. 340-58.000.

Yamamoto, Toshio: *See*—
Yuge, Shizuo; Yamamoto, Toshio; and Sakakibara, Susumu, 4,376,813, Cl. 430-100.000.

Yamasaki, Ichiro: *See*—
Moriwaki, Toshimoto; Hani, Kiyoshi; Kubota, Shigeru; Eto, Shohei; Fukami, Akira; and Yamasaki, Ichiro, 4,376,840, Cl. 524-779.000.

Yamasaki, Yakanori: *See*—
Senda, Jibei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; Akagi, Akio; and Yamasaki, Yakanori, 4,376,656, Cl. 106-309.000.

Yamashita, Koji: *See*—
Abe, Hideaki; and Yamashita, Koji, 4,377,003, Cl. 455-90.000.

Yamashita, Toshio: *See*—
Komiya, Kazumi; Yamashita, Toshio; and Ohno, Masaru, 4,376,795, Cl. 427-75.000.

Yamazaki, Masami: *See*—
Okano, Hiroshi; and Yamazaki, Masami, 4,376,617, Cl. 417-407.000.

Yang, Kang: *See*—
Nield, Gerald L.; Yang, Kang; and Washecheck, Paul H., 4,376,868, Cl. 562-465.000.

Yang, Lien C., to California Institute of Technology. Apparatus and method for destructive removal of particles contained in flowing fluid. 4,376,637, Cl. 55-2.000.

Yano, Hiroshi: *See*—
Iijima, Tetsuya; and Yano, Hiroshi, 4,376,408, Cl. 98-2.030.

Yarczower, Donald J. Night time fishing aid. 4,376,349, Cl. 43-17.000.

Yeou, Victor, to Poclain. Earthworking machine of the loader type. 4,376,612, Cl. 414-694.000.

Yokoi, Gunpei, to Nintendo Co., Ltd. Rotary puzzle device. 4,376,537, Cl. 273-153.00S.

Yokooku, Katsuhiko; and Iida, Katsuyoshi, to Toyo Kogyo Co., Ltd. Air-fuel ratio control system with altitude compensator. 4,376,431, Cl. 123-440.000.

Yokoyama, Tadashi: *See*—
Iwata, Masayosi; Furuhashi, Kenshi; and Yokoyama, Tadashi, 4,376,878, Cl. 200-61.270.

York, Gregg E.: *See*—
Newby, Robert A.; and York, Gregg E., 4,376,397, Cl. 81-177.00A.

Yoshida, Tadashi: *See*—
Narisada, Masayuki; Okada, Tetso; Yoshida, Tadashi; and Matsuura, Shinzo, 4,376,770, Cl. 424-248.510.

Yoshino, Tadashi: *See*—
Torii, Michihiro; Moritomo, Takao; Suzuki, Kouichirou; Yoshino, Tadashi; Itoh, Norifumi; and Suzuki, Tetsuya, 4,376,961, Cl. 360-106.000.

Young, Robert N.: *See*—
Belanger, Patrice C.; and Young, Robert N., 4,376,779, Cl. 424-274.000.

Young, Susan K.: *See*—
Brown, R. Clark; Cotter, Richard; and Young, Susan K., 4,376,819, Cl. 435-4.000.

Youngblood, Ralph A., to Ford Motor Company. Adaptive cylinder by cylinder knock retard control. 4,376,429, Cl. 123-425.000.

Yuasa Battery Co., Ltd.: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,376,794, Cl. 427-44.000.

Yuge, Shizuo; Yamamoto, Toshio; and Sakakibara, Susumu, to Minolta Camera Kabushiki Kaisha. Reversal development method of electrostatic latent image by the use of high-resistivity magnetic toner. 4,376,813, Cl. 430-100.000.

Zabelka, Michal: *See*—
Wynn, Nicholas P.; and Zabelka, Michal, 4,376,653, Cl. 106-103.000.

Zagadarchuk, Vasily F.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Kazimov, Boris I.; Zagadarchuk, Vasily F.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,376,882, Cl. 219-100.000.

Zahn, Heinrich, to Robert Bosch GmbH. Magnetic tape transducer apparatus drive arrangement. 4,376,503, Cl. 226-181.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Okami, Yoshiro; Yamada, Kazuhiko; and Takashio, Masachika, 4,376,761, Cl. 424-48.000.

Zeeh, Bernd: *See*—
Rentzea, Costin; Feuerherd, Karl-Heinz; Zeeh, Bernd; Sauter, Hubert; and Pommer, Ernst-Heinrich, 4,376,776, Cl. 424-267.000.

Zesel, Joseph A., to United States of America, Navy. Antenna cable. 4,376,941, Cl. 343-709.000.

Zenith Radio Corporation: *See*—
Collins, Johnny; and Hendrickson, Melvin C., 4,377,006, Cl. 455-603.000.
Rowe, William A., 4,376,949, Cl. 358-60.000.
Ziegler, Anna E.: *See*—
Bosies, Elmar; Heerdt, Ruth; Gall, Rudi; Bicker, Uwe; and Ziegler, Anna E., 4,376,731, Cl. 260-239.00E.
Zimmer, Johann: *See*—
Maurer, Werner; and Zimmer, Johann, 4,376,859, Cl. 544-348.000.
Zimmerman, Robert L.: *See*—
Speranza, George P.; and Zimmerman, Robert L., 4,376,832, Cl. 521-115.000.
Zola, John C. Aqueous multiphase dispersions and preparation thereof. 4,376,654, Cl. 106-163.00R.
Zyss, Joseph: *See*—
Chemla, Daniel; Zyss, Joseph; and Nicoud, Jean-Francois, 4,376,899, Cl. 307-425.000.
Zytan Thermochemische Verfahrenstechnik GmbH & Co. KG: *See*—
Briem, Karl; and Lauriea, Hanno, 4,376,750, Cl. 264-336.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MARCH, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See*—
Plewes, John T., Re. 31,180, Cl. 148-412.000.

Crager, William C.; Umarji, Sudhindra R.; Griffin, Robert H.; and Louit, Gerard J., to International Telephone and Telegraph Corporation. Packet-switched data communication system. Re. 31,182, Cl. 178-3.000.

Daswick, Alexander C. Sporting shoe. Re. 31,173, Cl. 36-30.00R.

Deacon, Scott C., to Ricon Corporation. Wheelchair lift. Re. 31,178, Cl. 414-546.000.

Griffin, Robert H.: *See*—
Crager, William C.; Umarji, Sudhindra R.; Griffin, Robert H.; and Louit, Gerard J., Re. 31,182, Cl. 178-3.000.

Hater, Martin: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, Re. 31,179, Cl. 71-25.000.

Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection system. Re. 31,174, Cl. 123-489.000.

International Telephone and Telegraph Corporation: *See*—
Crager, William C.; Umarji, Sudhindra R.; Griffin, Robert H.; and Louit, Gerard J., Re. 31,182, Cl. 178-3.000.

Iwamoto, Tamio: *See*—
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, Re. 31,177, Cl. 355-3.00R.

Jefferson Smurfit Incorporated: *See*—
Raubenheimer, Wallace O., Re. 31,176, Cl. 229-15.000.

Kleinberg, Israel. Means and method for improving natural defenses against caries. Re. 31,181, Cl. 424-88.000.

Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio. Apparatus for making plates for printing. Re. 31,177, Cl. 355-3.00R.

Kraus, Bernd: *See*—
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, Re. 31,174, Cl. 123-489.000.

Louit, Gerard J.: *See*—
Crager, William C.; Umarji, Sudhindra R.; Griffin, Robert H.; and Louit, Gerard J., Re. 31,182, Cl. 178-3.000.

Meininghaus, Fritz: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, Re. 31,179, Cl. 71-25.000.

Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, to Uhde GmbH. Method of processing waste sludge from wet phosphoric acid purification facilities. Re. 31,179, Cl. 71-25.000.

Oda, Hatsuo: *See*—
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, Re. 31,177, Cl. 355-3.00R.

O'Hanlon, Edward J. Means and methods for sending heat downwardly. Re. 31,175, Cl. 165-104.220.

Plewes, John T., to Bell Telephone Laboratories, Incorporated. Quaternary spinodal copper alloys. Re. 31,180, Cl. 148-412.000.

Raubenheimer, Wallace O., to Jefferson Smurfit Incorporated. Carton divider. Re. 31,176, Cl. 229-15.000.

Ricon Corporation: *See*—
Deacon, Scott C., Re. 31,178, Cl. 414-546.000.

Robert Bosch GmbH: *See*—
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, Re. 31,174, Cl. 123-489.000.

Sakata, Minehiro: *See*—
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, Re. 31,177, Cl. 355-3.00R.

Sautter, Wilfried: *See*—
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, Re. 31,174, Cl. 123-489.000.

Scheel, Rudiger: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, Re. 31,179, Cl. 71-25.000.

Uhde GmbH: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, Re. 31,179, Cl. 71-25.000.

Umarji, Sudhindra R.: *See*—
Crager, William C.; Umarji, Sudhindra R.; Griffin, Robert H.; and Louit, Gerard J., Re. 31,182, Cl. 178-3.000.

Wessel, Wolf: *See*—
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, Re. 31,174, Cl. 123-489.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

McCarty, Ralph W., to Extrude Hone Corporation. Apparatus for abrading by extrusion and abrading medium. B1 3,634,973, Cl. 51—2 R.

Extrude Hone Corporation: *See*—
McCarty, Ralph W. B1 3,634,973, Cl. 51—2 R.

Laing, Jean Wilcox, to Xerox Corporation. Coronode tensioning and support arrangement. B1 4,099,219, Cl. 361—230.

Xerox Corporation: *See*—
Laing, Jean Wilcox. B1 4,099,219, Cl. 361-230.

Sakurado, Seiichi; Miyazaki, Yasuaki; Hattori, Tatsuaki; Shiraishi, Makoto; and Inoue, Taisei, to Kuraray Co., Ltd.; Asahi Co., Ltd.; and Koyo Sangyo Co., Ltd. Adhesive composition consisting of polyvinylalcohol solution or polyvinylacetate latex modified with hydrophobic solution of isocyanate compound. B1 3,931,008, Cl. 524—197.

Kuraray Co., Ltd.; Asahi Co., Ltd.; and Koyo Sangyo Co., Ltd.: *See*—
Sakurada, Seiichi; Miyazaki, Yasuaki; Hattori, Tatsuaki; Shiraishi, Makoto; and Inoue, Taisei. B1 3,931,088, Cl. 524—107.

LIST OF DESIGN PATENTEES

Alie, Enrique; Bishop, Donald R.; and Ryan, James M., to Polaroid Corporation. Photographic camera or similar article. 268,267, 3-15-83, Cl. D16-1.000.

Amerock Corporation: *See*—
Tegner, Raymond U. H., 268,246, Cl. D8-351.000.

AMP Incorporated: *See*—
Frantz, Robert H., 268,262, Cl. D13-24.000.

Ancra Corporation: *See*—
Prete, Ernest, Jr., 268,247, Cl. D8-383.000.

Argyropoulos, James P., to Cherokee Shoe Company, Inc. Shoe sole. 268,221, 3-15-83, Cl. D2-322.000.
Bayerische Motoren Werke A.G.: *See*—
Boyer, Boyke, 268,261, Cl. D12-211.000.
Kerschbaum, Hans; and Gevert, Klaus V., 268,260, Cl. D12-209.000.
Bergquist, Gregory D., to Simmons Universal Corporation. Chaise. 268,235, 3-15-83, Cl. D6-38.000.
Bishop, Donald R.: *See*—
Alie, Enrique; Bishop, Donald R.; and Ryan, James M., 268,267, Cl. D16-1.000.
Bliss & Laughlin Industries, Incorporated: *See*—
Johnson, David B.; and Schroeder, Verdell H., 268,266, Cl. D15-72.000.
Bonnefoy, Francis, to Etablissements Georges Monin. Bottle. 268,248, 3-15-83, Cl. D9-372.000.
Boschetti, Armando, to Paul B. Elder Company. Ultraviolet lamp. 268,287, 3-15-83, Cl. D24-68.000.
Boyer, Boyke, to Bayerische Motoren Werke A.G. Wheel for motor vehicle. 268,261, 3-15-83, Cl. D12-211.000.
Brescia, Anthony J.; and Rhoads, Spencer, to Syroco, Inc. Combined storage unit and mirror therefor. 268,238, 3-15-83, Cl. D6-136.000.
Bricker, James C.: *See*—
Wichmann, Frederick R.; and Bricker, James C., 268,282, Cl. D23-151.000.
Brown, Tate H. Post operative surgical binder/surgical dressing fabric of the plush back type. 268,286, 3-15-83, Cl. D24-49.000.
Bullock, W. Craig; Reid, Francis J.; Tetirick, Oliver T.; and Tripp, Robert R., to Odetics, Inc. Video cassette recorder or the like. 268,263, 3-15-83, Cl. D14-6.000.
Caldwell, Charles W.; and Justiss, William B. Caliper type body fat calculator. 268,254, 3-15-83, Cl. D10-73.000.
Chambers, Richard G., to Eaton Corporation. Clock thermostat housing. 268,252, 3-15-83, Cl. D10-60.000.
Chen, Yi-yi. Glove. 268,222, 3-15-83, Cl. D2-367.000.
Cherokee Shoe Company, Inc.: *See*—
Argyropoulos, James P., 268,221, Cl. D2-322.000.
Chevassus, Alain, to Lefebure Isolants Reunis. Box for cosmetic products or the like. 268,292, 3-15-83, Cl. D28-83.000.
Clairol Incorporated: *See*—
Ellenson, Bernard, 268,225, Cl. D4-21.000.
Claman, Mike T. Ottoman. 268,234, 3-15-83, Cl. D6-36.000.
Clive Investments Pty. Ltd.: *See*—
Cowdroy, Thorp C., 268,288, Cl. D25-74.000.
Conley, Richard B.: *See*—
Manno, Joseph J.; Truitt, Robert B.; and Conley, Richard B., 268,284, Cl. D24-8.000.
Cowdroy, Thorp C., to Clive Investments Pty. Ltd. Section for use in a display apparatus. 268,288, 3-15-83, Cl. D25-74.000.
Crespi, Garbriella. Extensible table. 268,239, 3-15-83, Cl. D6-178.000.
Crespi, Garbriella. Extendible table or similar article. 268,240, 3-15-83, Cl. D6-178.000.
Diebold, Grant V. Ashtray. 268,289, 3-15-83, Cl. D27-10.000.
Eaton Corporation: *See*—
Chambers, Richard G., 268,252, Cl. D10-60.000.
Ellenson, Bernard, to Clairol Incorporated. Combined brush and comb. 268,225, 3-15-83, Cl. D4-21.000.
Etablissements Georges Monin: *See*—
Bonnefoy, Francis, 268,248, Cl. D9-372.000.
F.C.F. Limited: *See*—
McBrien, Roderick, 268,290, Cl. D28-13.000.
Faulkner, David J. Wood carrier. 268,223, 3-15-83, Cl. D3-30.100.
Fender, C. Leo. Saddle for bass guitar bridge or similar article. 268,272, 3-15-83, Cl. D17-20.000.
Fitk, Kent W. Combined hood, fenders and headlight housing unit. 268,258, 3-15-83, Cl. D12-164.000.
Fitchett, Albert J. Frame. 268,242, 3-15-83, Cl. D6-242.000.
Florists' Transworld Delivery Association: *See*—
Waterfield, Martin J., 268,255, Cl. D11-152.000.
Frantz, Robert H., to AMP Incorporated. Switched adapter for electrical connector. 268,262, 3-15-83, Cl. D13-24.000.
Fraze, Ermal C.: *See*—
Smyth, George F., 268,250, Cl. D9-438.000.
Gardisette International AG: *See*—
Stocker, Hans, 268,293, Cl. D47-6.00E.
Stocker, Hans, 268,294, Cl. D47-6.00E.
Gasperini, Eugene. Photographic exposure chamber. 268,268, 3-15-83, Cl. D16-10.000.
Geller, Douglas A.; and McElroy, David C., to Wham-O-Mfg. Co. Play sprinkler or the like. 268,279, 3-15-83, Cl. D23-9.000.
George, Gary P., to Stout Industries, Inc. Holder for displaying discrete portions of multiple indicia sign rolls. 268,273, 3-15-83, Cl. D20-44.000.
Gevert, Klaus V.: *See*—
Kerschbaum, Hans; and Gevert, Klaus V., 268,260, Cl. D12-209.000.
Gibson, J. Scott, to Mitel Corporation. Telephone line and trunk status display. 268,265, 3-15-83, Cl. D14-58.000.
Goedken, James H., to Hoover Universal, Inc. Container for bulk liquids. 268,249, 3-15-83, Cl D9-375.000.
Gooding, Elwyn R., to University of Michigan, The Regents of the. Military helmet with visor. 268,220, 3-15-83, Cl. D2-232.000.
Gordon Ellis and Company: *See*—
Rodger, Michael, 268,280, Cl. D23-71.000.
Greenberg, Sheldon, to Shelcore, Inc. Multiple element pop-up toy. 268,274, 3-15-83, Cl. D21-59.000.
Greenberg, Sheldon, to Shelcore, Inc. Inflatable crib gym toy. 268,275, 3-15-83, Cl. D21-63.000.
Hicks, Roy T. Fan enclosure. 268,283, 3-15-83, Cl. D23-155.000.
Hoover Universal, Inc.: *See*—
Goedken, James H., 268,249, Cl. D9-375.000.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 268,226, 3-15-83, Cl. D4-38.100.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 268,227, 3-15-83, Cl. D4-38.100.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 268,228, 3-15-83, Cl. D4-38.100.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 268,229, 3-15-83, Cl. D4-38.100.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 268,230, 3-15-83, Cl. D4-38.100.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 268,231, 3-15-83, Cl. D4-38.100.
Horton, Carl, to Horton Company, The. Ambulance trailer or the like. 268,257, 3-15-83, Cl. D12-105.000.
Horton Company, The: *See*—
Horton, Carl, 268,257, Cl. D12-105.000.
Hull, James W. Chair panel. 268,241, 3-15-83, Cl. D6-191.000.
Huntebrinker, Tom; and Kircher, William B., to North Fork Industries, Inc. Fishing lure holder. 268,224, 3-15-83, Cl. D3-38.000.
Imada, Michio, to Olympus Optical Company Ltd. Collator for use with copier. 268,269, 3-15-83, Cl. D16-32.000.
Inoue, Yoshitaka: *See*—
Makino, Katsuhiko; and Inoue, Yoshitaka, 268,245, Cl. D8-42.000
Interdica S.A.: *See*—
Kanoui, Joseph, 268,271, Cl. D16-102.000.
IVAC Corporation: *See*—
Manno, Joseph J.; Truitt, Robert B.; and Conley, Richard B., 268,284, Cl. D24-8.000.
Johnson, David B.; and Schroeder, Verdell H., to Bliss & Laughlin Industries, Incorporated. Pulley and belt guard for a portable bag closing sewing machine. 268,266, 3-15-83, Cl. D15-72.000.
Jones, Graham R., to Wilkinson Sword, Limited. Razor handle. 268,291, 3-15-83, Cl. D28-48.000.
Justiss, William B.: *See*—
Caldwell, Charles W.; and Justiss, William B., 268,254, Cl. D10-73.000.
Kanoui, Joseph, to Interdica S.A. Spectacles. 268,271, 3-15-83, Cl. D16-102.000.
Kennedy, Gary W. Bolt and screw sizer gage. 268,253, 3-15-83, Cl. D10-64.000.
Kerschbaum, Hans; and Gevert, Klaus V., to Bayerische Motoren Werke A.G. Wheel for motor vehicle. 268,260, 3-15-83, Cl. D12-209.000.
Kircher, William B.: *See*—
Huntebrinker, Tom; and Kircher, William B., 268,224, Cl. D3-38.000.
Knoll International, Inc.: *See*—
Stephens, William I., 268,233, Cl. D6-30.000.
Lefebure Isolants Reunis: *See*—
Chevassus, Alain, 268,292, Cl. D28-83.000.
Les Industries Provinciales Limitee: *See*—
Morin, Andre, 268,243, Cl. D7-102.000.
Morin, Andre, 268,244, Cl. D7-104.000.
Lindsley, John C., to Paccar Inc. Front panel for a truck. 268,259, 3-15-83, Cl. D12-196.000.
Makino, Katsuhiko; and Inoue, Yoshitaka, to Matsushita Electric Industrial Co., Ltd. Wine cork remover. 268,245, 3-15-83, Cl. D8-42.000.
Manno, Joseph J.; Truitt, Robert B.; and Conley, Richard B., to IVAC Corporation. Parenteral fluid administration instrument. 268,284, 3-15-83, Cl. D24-8.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Makino, Katsuhiko; and Inoue, Yoshitaka, 268,245, Cl. D8-42.000.
McBrien, Roderick, to F.C.F. Limited. Hair dryer. 268,290, 3-15-83, Cl. D28-13.000.
McElroy, David C.: *See*—
Geller, Douglas A.; and McElroy, David C., 268,279, Cl. D23-9.000.
Mitel Corporation: *See*—
Gibson, J. Scott, 268,265, Cl. D14-58.000.
Morin, Andre, to Les Industries Provinciales Limitee. Spatula or similar article. 268,243, 3-15-83, Cl. D7-102.000.
Morin, Andre, to Les Industries Provinciales Limitee. Ladle or similar article. 268,244, 3-15-83, Cl D7-104.000.
Nippon Paint Co., Ltd.: *See*—
Hori, Kiyoshi, 268,226, Cl. D4-38.100.
Hori, Kiyoshi, 268,227, Cl. D4-38.100.
Hori, Kiyoshi, 268,228, Cl. D4-38.100.
Hori, Kiyoshi, 268,229, Cl. D4-38.100.
Hori, Kiyoshi, 268,230, Cl. D4-38.100.
Hori, Kiyoshi, 268,231, Cl. D4-38.100.
North Fork Industries, Inc.: *See*—
Huntebrinker, Tom; and Kircher, William B., 268,224, Cl. D3-38.000.
Odetics, Inc.: *See*—
Bullock, W. Craig; Reid, Francis J.; Tetirick, Oliver T.; and Tripp, Robert R., 268,263, Cl. D14-6.000.

Olympus Optical Company Ltd.: *See*—
Imada, Michio, 268,269, Cl. D16-32.000.
Ostlund, Roland S.; and Ostlund, Rolf S. Adjustable photoflash holder. 268,270, 3-15-83, Cl. D16-47.000.
Ostlund, Rolf S.: *See*—
Ostlund, Roland S.; and Ostlund, Rolf S., 268,270, Cl. D16-47.000.
Paccar Inc.: *See*—
Lindsley, John C., 268,259, Cl. D12-196.000.
Paul B. Elder Company: *See*—
Boschetti, Armando, 268,287, Cl. D24-68.000.
Peintures Corona S.A.: *See*—
Polak, Danica, 268,296, Cl. D92-25.000.
Polak, Danica, 268,297, Cl. D92-25.000.
Peterson, Paul D. Planter. 268,256, 3-15-83, Cl. D11-155.000.
Polak, Danica, to Peintures Corona S.A. Wall covering. 268,296, 3-15-83, Cl. D92-25.000.
Polak, Danica, to Peintures Corona S.A. Wall covering. 268,297, 3-15-83, Cl. D92-25.000.
Polaroid Corporation: *See*—
Alie, Enrique; Bishop, Donald R.; and Ryan, James M., 268,267, Cl. D16-1.000.
Prete, Ernest, Jr., to Ancra Corporation. Ratchet buckle. 268,247, 3-15-83, Cl. D8-383.000.
Prikkel, John, III. Damper. 268,281, 3-15-83, Cl. D23-127.000.
Quaker Oats Company, The: *See*—
Wilkes, Kenneth R., 268,264, Cl. D14-17.000.
Rados, Ivan. Educational furniture puzzle or similar article. 268,276, 3-15-83, Cl. D21-107.000.
Reid, Francis J.: *See*—
Bullock, W. Craig; Reid, Francis J.; Tetirick, Oliver T.; and Tripp, Robert R., 268,263, Cl. D14-6.000.
Rhoads, Spencer: *See*—
Brescia, Anthony J.; and Rhoads, Spencer, 268,238, Cl. D6-136.000.
Rodger, Michael, to Gordon Ellis and Company. Bath seat. 268,280, 3-15-83, Cl. D23-71.000.
Ryan, James M.: *See*—
Alie, Enrique; Bishop, Donald R.; and Ryan, James M., 268,267, Cl. D16-1.000.
Savage, Richard C., to United Brands Company. Package insert. 268,251, 3-15-83, Cl. D9-456.000.
Scales, Mary E. Baby exerciser. 268,232, 3-15-83, Cl. D6-5.000.
Schoerner, Roger J., to Southwire Company. Sheet for wrapping coiled rod or similar article. 268,295, 3-15-83, Cl. D59-2.00C.
Schroeder, Verdell H.: *See*—
Johnson, David B.; and Schroeder, Verdell H., 268,266, Cl. D15-72.000.
Shelcore, Inc.: *See*—
Greenberg, Sheldon, 268,274, Cl. D21-59.000.
Greenberg, Sheldon, 268,275, Cl. D21-63.000.
Simmons Universal Corporation: *See*—
Bergquist, Gregory D., 268,235, Cl. D6-38.000.
Simon, Arynne. Wall mounted prize ribbons display rack. 268,237, 3-15-83, Cl. D6-114.000.
Smith, David B. Combined main beam and seat carriage for a rowing machine. 268,277, 3-15-83, Cl. D21-191.000.
Smith, David B. Rowing machine. 268,278, 3-15-83, Cl. D21-195.000.
Smyth, George F., to Fraze, Ermal C. Tab for an easy opening can end. 268,250, 3-15-83, Cl. D9-438.000.
Southwire Company: *See*—
Schoerner, Roger J., 268,295, Cl. D59-2.00C.
Stephens, William I., to Knoll International, Inc. Chairs. 268,233 3-15-83, Cl. D6-30.000.
Stern, Marilyn M. Couch. 268,236, 3-15-83, Cl. D6-63.000.
Stocker, Hans, to Gardisette International AG. Curtain material. 268,293, 3-15-83, Cl. D47-6.00E.
Stocker, Hans, to Gardisette International AG. Curtain material. 268,294, 3-15-83, Cl. D47-6.00E.
Stout Industries, Inc.: *See*—
George, Gary P., 268,273, Cl. D20-44.000.
Syroco, Inc.: *See*—
Brescia, Anthony J.; and Rhoads, Spencer, 268,238, Cl. D6-136.000.
Tegner, Raymond U. H., to Amerock Corporation. Escutcheon. 268,246, 3-15-83, Cl. D8-351.000.
Tetirick, Oliver T.: *See*—
Bullock, W. Craig; Reid, Francis J.; Tetirick, Oliver T.; and Tripp, Robert R., 268,263, Cl. D14-6.000.
Tripp, Robert R.: *See*—
Bullock, W. Craig; Reid, Francis J.; Tetirick, Oliver T.; and Tripp, Robert R., 268,263, Cl. D14-6.000.
Truitt, Robert B.: *See*—
Manno, Joseph J.; Truitt, Robert B.; and Conley, Richard B., 268,284, Cl. D24-8.000.
United Air Specialists, Inc.: *See*—
Wichmann, Frederick R.; and Bricker, James C., 268,282, Cl. D23-151.000.
United Brands Company: *See*—
Savage, Richard C., 268,251, Cl. D9-456.000.
University of Michigan, The Regents of the: *See*—
Gooding, Elwyn R., 268,220, Cl. D2-232.000.
Waterfield, Martin J., to Florists' Transworld Delivery Association. Planter bowl. 268,255, 3-15-83, Cl. D11-152.000.
Wham-O-Mfg. Co.: *See*—
Geller, Douglas A.; and McElroy, David C., 268,279, Cl. D23-9.000.
Wichmann, Frederick R.; and Bricker, James C., to United Air Specialists, Inc. Fume capture hood. 268,282, 3-15-83, Cl. D23-151.000.
Wilkes, Kenneth R., to Quaker Oats Company, The. Phonographic turntable. 268,264, 3-15-83, Cl. D14-17.000.
Wilkinson Sword, Limited: *See*—
Jones, Graham R., 268,291, Cl. D28-48.000.
Zinnecker, Walter H. Molded plastic decontamination stand for bronchofiberscopes. 268,285, 3-15-83, Cl. D24-31.000.

LIST OF PLANT PATENTEES

Anderson, Henry P.; and Puryear, Kenneth L. Pistachio tree. 4,994, 3-15-83, Cl. 30.000.
Carlton Rose Nurseries, Inc.: *See*—
Van Veen, Jan, 4,992, Cl. 21.000.
Comstock, Clifton C., to Monrovia Nursery Company. Bougainvillea selection. 4,995, 3-15-83, Cl. 54.000.
Conard-Pyle Company, The: *See*—
Meserve, Kathleen K., 4,996, Cl. 65.000.
Dickson, A. Patrick C., to Jackson & Perkins Company. Rose plant. 4,991, 3-15-83, Cl. 9.000.
Ellison, J. Howard, to Research Corporation. Asparagus plant Jersey Centennial. 4,998, 3-15-83, Cl. 89.000.
Ellison, J. Howard, to Research Corporation. Asparagus Plant No. 22. 4,999, 3-15-83, Cl. 89.000.
Frampton's Nurseries Limited: *See*—
Lintott, Keith, 4,997, Cl. 80.000.
Jackson & Perkins Company: *See*—
Dickson, A. Patrick C., 4,991, Cl. 9.000.
Warriner, William A., 4,990, Cl. 8.000.
Lintott, Keith, to Frampton's Nurseries Limited. Chrysanthemum plant. 4,997, 3-15-83, Cl. 80.000.
McGredy, Samuel D. Rose plant. 4,993, 3-15-83, Cl. 22.000.
Meserve, Kathleen K., to Conard-Pyle Company, The. Ilex plant—Meschick variety. 4,996, 3-15-83, Cl. 65.000.
Monrovia Nursery Company: *See*—
Comstock, Clifton C., 4,995, Cl. 54.000.
Puryear, Kenneth L.: *See*—
Anderson, Henry P.; and Puryear, Kenneth L., 4,994, Cl. 30.000.
Research Corporation: *See*—
Ellison, J. Howard, 4,998, Cl. 89.000.
Ellison, J. Howard, 4,999, Cl. 89.000.
Van Veen, Jan, to Carlton Rose Nurseries, Inc. Rose plant. 4,992, 3-15-83, Cl. 21.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant—Jacsun. 4,990, 3-15-83, Cl. 8.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 15, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3

1.7 4,376,312

CLASS 4

255 4,376,313
431 4,376,314
4,376,315

CLASS 5

66 4,376,316
80 4,376,317
99 C 4,376,318

CLASS 8

125 4,376,632
184 4,376,633

CLASS 14

71.3 4,376,319

CLASS 15

1.7 4,376,320
104.3 SN 4,376,321
323 4,376,322

CLASS 16

51 4,376,323
236 4,376,324

CLASS 17

18 4,376,325
21 4,376,326
39 4,376,327

CLASS 29

25.42 4,376,329
116 AD 4,376,330
219 4,376,331
402.08 4,376,332
432 4,376,333
437 4,376,334
447 4,376,335
571 4,376,336
603 4,376,337
741 4,376,338
876 4,376,339

CLASS 30

134 4,376,340

CLASS 33

174 S 4,376,341

CLASS 34

86 4,376,342
109 4,376,343

CLASS 36

7.1 R 4,376,344
30 R Re.31,173

CLASS 37

260 4,376,345

CLASS 40

114 4,376,346
441 4,376,347
513 4,376,348

CLASS 43

17 4,376,349
26.1 4,376,350

CLASS 44

56 4,376,635
4,376,636

CLASS 46

23 4,376,351

CLASS 49

68 4,376,352
504 4,376,353
4,376,354

CLASS 51

2 R B1 3,634,973
58 4,376,355
98 R 4,376,356
105 SP 4,376,357
429 4,376,358

CLASS 52

127 4,376,359
193 4,376,360
241 4,376,361
639 4,376,362

CLASS 53

52 4,376,363
54 4,376,364
555 4,376,365

CLASS 54

24 4,376,366

CLASS 55

2 4,376,637
20 4,376,638
26 4,376,639
4,376,640
67 4,376,641
105 4,376,642

CLASS 56

400.17 4,376,367

CLASS 57

264 4,376,368

CLASS 60

226.3 4,376,375
276 4,376,369
337 4,376,370
420 4,376,371
641.15 4,376,372
648 4,376,373
687 4,376,374

CLASS 62

51 4,376,376
55.5 4,376,377

CLASS 65

351 4,376,643

CLASS 68

16 4,376,378

CLASS 70

118 4,376,379
303 A 4,376,380
337 4,376,381
338 4,376,382
456 R 4,376,383

CLASS 71

25 Re.31,179
87 4,376,644
105 4,376,645
120 4,376,646

CLASS 72

135 4,376,384
479 4,376,385

CLASS 73

1 C 4,376,386
12 4,376,388
118 4,376,389
517 A 4,376,390
863.12 4,376,391
864.45 4,376,392

CLASS 74

11 4,376,387
579 R 4,376,393
750 B 4,376,394

CLASS 75

7 4,376,647
35 4,376,648
78 4,376,649
129 4,376,650

CLASS 81

3 R 4,376,395
57.14 4,376,396
177 A 4,376,397

CLASS 82

2.5 4,376,398

CLASS 83

13 4,376,399
109 4,376,400
319 4,376,401

CLASS 84

176 4,376,402
384 4,376,403
464 R 4,376,404

CLASS 89

1.806 4,376,405
7 4,376,406
20 R 4,376,407

CLASS 98

2.03 4,376,408

CLASS 99

509 4,376,409

CLASS 100

214 4,376,410

CLASS 101

93.14 4,376,411
124 4,376,412
182 4,376,413
415.1 4,376,414

CLASS 106

38.24 4,376,651
103 4,376,653
163 R 4,376,654
300 4,376,655
309 4,376,656

CLASS 112

121.11 4,376,415

CLASS 114

39 4,376,416
106 4,376,417
178 4,376,418
219 4,376,419
345 4,376,420

CLASS 116

211 4,376,421

CLASS 119

1 4,376,422

CLASS 123

1 A 4,376,423
41.12 4,376,424
90.38 4,376,425
198 F 4,376,426
339 4,376,427
417 4,376,428
425 4,376,429
438 4,376,430
440 4,376,431
450 4,376,432
478 4,376,433
489 Re.31,174

CLASS 126

299 D 4,376,434
435 4,376,435
437 4,376,436

CLASS 128

82.1 4,376,437
90 4,376,438
276 4,376,439

CLASS 132

9 4,376,441

CLASS 133

3 C 4,376,442

CLASS 134

168 R 4,376,443

CLASS 136

249 4,376,872

CLASS 137

1 4,376,444
68 R 4,376,445
202 4,376,446
244 4,376,447
329.02 4,376,448
391 4,376,449
554 4,376,450
588 4,376,451
615 4,376,452
625.64 4,376,453
798 4,376,454

CLASS 139

383 A 4,376,455

CLASS 145

33 A 4,376,456

CLASS 148

1.5 4,376,657
4,376,658
4,376,659
11.5 P 4,376,660
12 C 4,376,661
12.3 4,376,662
171 4,376,663
175 4,376,664
412 Re.31,180

CLASS 149

22 4,376,665
109.6 4,376,666

CLASS 152

213 R 4,376,457
362 R 4,376,458

CLASS 156

83 4,376,667
92 4,376,668
161 4,376,669
244.21 4,376,670
549 4,376,671
643 4,376,672
662 4,376,673

CLASS 162

136 4,376,674
145 4,376,675

CLASS 165

96 4,376,459
104.22 Re.31,175
167 4,376,460
170 4,376,461

CLASS 166

267 4,376,462
285 4,376,463
324 4,376,464

CLASS 169

39 4,376,465
53 4,376,466

CLASS 174

65 SS 4,376,873

CLASS 175

7 4,376,467
304 4,376,468

CLASS 178

3 Re.31,182

CLASS 179

15.55 T 4,376,874
18 B 4,376,875
77 4,376,876

CLASS 181

142 4,376,469

CLASS 182

23 4,376,470

CLASS 187

29 R 4,376,471

CLASS 188

322.22 4,376,472

CLASS 192

3.58 4,376,473
4 A 4,376,474
53 F 4,376,475
84 R 4,376,476
106.2 4,376,477

CLASS 194

1 N 4,376,478
4,376,479
101 4,376,480

CLASS 196

46 4,376,676

CLASS 198

382 4,376,481
394 4,376,482

CLASS 200

1 B 4,376,877
61.27 4,376,878
314 4,376,879

CLASS 202

267 A 4,376,677

CLASS 203

9 4,376,678
71 4,376,679
89 4,376,680

CLASS 204

1 T 4,376,681
14 N 4,376,682
15 4,376,683
4,376,684
52 R 4,376,685
129.85 4,376,686
181 C 4,376,687
192 S 4,376,688
195 B 4,376,689
243 R 4,376,690
265 4,376,691
298 4,376,692

CLASS 206

484 4,376,483

CLASS 208

11 LE 4,376,693
48 R 4,376,694
59 4,376,695
120 4,376,696
4,376,697
215 4,376,698
4,376,699

CLASS 209

17 4,376,700
535 4,376,484
575 4,376,485

CLASS 210

96.1 4,376,701
201 4,376,702
238 4,376,703
326 4,376,704
413 4,376,705
678 4,376,706
679 4,376,707
705 4,376,708

CLASS 211

35 4,376,486

CLASS 212

147 4,376,487

CLASS 213

61 4,376,488

CLASS 219

69 M 4,376,880
73.1 4,376,881
100 4,376,882
109 4,376,883
4,376,884
121 EC 4,376,885
121 ED 4,376,886

CLASS 220

1.5 4,376,489
82 R 4,376,490
200 4,376,491
210 4,376,492
307 4,376,493
444 4,376,494

CLASS 222

46 4,376,495
83.5 4,376,496
153 4,376,497
326 4,376,498
339 4,376,499
386.5 4,376,500
600 4,376,501

CLASS 224

42.43 4,376,502

CLASS 226

181 4,376,503

CLASS 227

32 4,376,504

CLASS 228

215 4,376,505

CLASS 229

5.6 4,376,506
15 Re.31,176
4,376,507
28 R 4,376,508
52 B 4,376,509

CLASS 235

487 4,376,887

CLASS 237

2 B 4,376,510

CLASS 239

14 4,376,511
106 4,376,512
231 4,376,513
690 4,376,514

CLASS 241

101 B 4,376,515

CLASS 242

36 4,376,516
47 4,376,517
84.2 R 4,376,518
199 4,376,519

CLASS 248

97 4,376,520
206 R 4,376,521
503.1 4,376,522

CLASS 250

211 J 4,376,888
213 VT 4,376,889
227 4,376,890
307 4,376,891
372 4,376,892
374 4,376,893

CLASS 251

61.1 4,376,523
86 4,376,524
149.6 4,376,525
328 4,376,526

CLASS 252

1 4,376,709
12.4 4,376,710
32.7 E 4,376,711
49.6 4,376,712
62.2 4,376,713
62.56 4,376,714
301.16 4,376,715
309 4,376,716
376 4,376,717
416 4,376,718
426 4,376,719
430 4,376,720
4,376,721
4,376,722
431 N 4,376,723
460 4,376,724
512 4,376,725
519 4,376,726

CLASS 254

29 A 4,376,527

CLASS 260

112 B 4,376,727
165 4,376,728
197 4,376,729
205 4,376,730
239 E 4,376,731
4,376,732
397.3 4,376,734
453 RW 4,376,735
462 R 4,376,736
509 4,376,737

CLASS 261
63 4,376,738
142 4,376,739

CLASS 264
10 4,376,740
43.9 4,376,741
85 4,376,742
103 4,376,743
106 4,376,744
109 4,376,745
167 4,376,746
176 F 4,376,747
255 4,376,748
258 4,376,749
336 4,376,750
341 4,376,751

CLASS 266
114 4,376,528

CLASS 270
53 4,376,529

CLASS 271
10 4,376,530
202 4,376,531

CLASS 272
97 4,376,532
137 4,376,533

CLASS 273
44 4,376,534
73 A 4,376,535
81.4 4,376,536
153 S 4,376,537
275 4,376,538

CLASS 277
1 4,376,539
3 4,376,540
153 4,376,541
189 4,376,542
237 R 4,376,543

CLASS 280
30 4,376,547
507 4,376,544
605 4,376,545
770 4,376,546

CLASS 285
114 4,376,549
149 4,376,548

CLASS 296
102 4,376,550

CLASS 297
250 4,376,551
391 4,376,552

CLASS 299
34 4,376,553

CLASS 301
63 DD 4,376,554

CLASS 307
9 4,376,895
115 4,376,896
297 4,376,898
425 4,376,899
473 4,376,900

CLASS 308
3.8 4,376,555
6 C 4,376,556
4,376,557

CLASS 310
10 4,376,901
54 4,376,902
154 4,376,903
208 4,376,904

CLASS 312
259 4,376,558

CLASS 313
217 4,376,905
332 4,376,906
389 4,376,907

CLASS 315
39.3 4,376,908
82 4,376,909
134 4,376,910
244 4,376,911
248 4,376,912

CLASS 318
85 4,376,913
603 4,376,914

CLASS 324
168 4,376,915

CLASS 330
136 4,376,916

CLASS 331
94.1 4,376,917
116 FE 4,376,918
158 4,376,919

CLASS 333
12 4,376,920
116 4,376,921
182 4,376,922
232 4,376,923

CLASS 335
210 4,376,924

CLASS 337
36 4,376,925
104 4,376,926
297 4,376,927
323 4,376,928

CLASS 338
4 4,376,929

CLASS 339
14 R 4,376,559
17 CF 4,376,560
21 R 4,376,561
75 M 4,376,562
91 R 4,376,563
92 R 4,376,564
186 M 4,376,565

CLASS 340
19 R 4,376,930
58 4,376,931
347 DD 4,376,933
571 4,376,935
815.17 4,376,934
825.3 4,376,936

CLASS 343
16 M 4,376,937
700 MS 4,376,938
709 4,376,941
715 4,376,939
840 4,376,940

CLASS 346
76 PH 4,376,942
135.1 4,376,943
140 R 4,376,944
4,376,945

CLASS 350
96.2 4,376,566
335 4,376,567
356 4,376,568
357 4,376,569
414 4,376,570
467 4,376,571
486 4,376,572

CLASS 351
212 4,376,573

CLASS 354
147 4,376,574
155 4,376,575

CLASS 355
3 DR 4,376,577
4,376,579
3 R Re.31,177
4,376,576
15 4,376,578
52 4,376,580
77 4,376,581

CLASS 356
71 4,376,582
237 4,376,585
401 4,376,584

CLASS 357
17 4,376,946
23 4,376,947

CLASS 358
13 4,376,948
60 4,376,949
90 4,376,950
106 4,376,951
166 4,376,952
197 4,376,953
312 4,376,954
314 4,376,955
322 4,376,956
334 4,376,957

CLASS 360
41 4,376,958
72.2 4,376,959
99 4,376,960
106 4,376,961
130.32 4,376,962
135 4,376,963

CLASS 361
230 B1 4,099,219
233 4,376,964

CLASS 362
191 4,376,965
249 4,376,966
306 4,376,967

CLASS 363
37 4,376,968
78 4,376,969

CLASS 364
167 4,376,970
184 4,376,971
200 4,376,972
4,376,973
4,376,974
4,376,975
4,376,976
4,376,977
408 4,376,978
424 4,376,979
565 4,376,980
570 4,376,981
900 4,376,982

CLASS 365
53 4,376,983
104 4,376,984
155 4,376,985
159 4,376,986
184 4,376,987
222 4,376,988
230 4,376,989

CLASS 367
95 4,376,990

CLASS 368
37 4,376,991
47 4,376,992
69 4,376,993
74 4,376,994
107 4,376,995
220 4,376,996

CLASS 369
270 4,376,997

CLASS 370
13 4,376,998
16 4,376,999

CLASS 371
11 4,377,000

CLASS 374
17 4,377,001

CLASS 376
152 4,376,752
305 4,376,753

CLASS 377
63 4,376,897

CLASS 378
093 4,377,002
110 4,376,894

CLASS 382
44 4,376,932

CLASS 400
185 4,376,585
229 4,376,586
247 4,376,587
322 4,376,588
606 4,376,589

CLASS 401
57 4,376,590
127 4,376,591

CLASS 403
26 4,376,592
231 4,376,593

CLASS 404
6 4,376,594
17 4,376,595
35 4,376,596

CLASS 405
195 4,376,597
258 4,376,598
282 4,376,599

CLASS 406
63 4,376,600
64 4,376,601
115 4,376,602

CLASS 409
140 4,376,603

CLASS 411
34 4,376,604
112 4,376,605
155 4,376,606

CLASS 414
24.6 4,376,607
217 4,376,608
335 4,376,609
416 4,376,610
462 4,376,611
546 Re.31,178
694 4,376,612

CLASS 415
53 T 4,376,613

CLASS 416
32 4,376,614

CLASS 417
50 4,376,615
153 4,376,616
407 4,376,617
417 4,376,618
540 4,376,619

CLASS 418
79 4,376,620

CLASS 420
573 4,376,754

CLASS 423
275 4,376,755
317 4,376,756
332 4,376,757
359 4,376,758
648 R 4,376,759

CLASS 424
1.5 4,376,760
48 4,376,761
49 4,376,762
4,376,763
78 4,376,764
88 Re.31,181
177 4,376,765
4,376,766
232 4,376,767
246 4,376,768
4,376,769
248.51 4,376,770
250 4,376,771
4,376,772
251 4,376,773
263 4,376,774
4,376,775
267 4,376,776
270 4,376,777
274 4,376,778
4,376,779
282 4,376,780
283 4,376,781
287 4,376,782
300 4,376,783
304 4,376,784
4,376,785
4,376,786
315 4,376,787
330 4,376,788
361 4,376,789

CLASS 425
72 R 4,376,621
139 4,376,622
143 4,376,623
464 4,376,624
564 4,376,625

CLASS 426
2 4,376,790
565 4,376,791

CLASS 427
6 4,376,792
34 4,376,793
44 4,376,794
75 4,376,795
82 4,376,796
302 4,376,797

CLASS 428
43 4,376,798
165 4,376,812
213 4,376,799
220 4,376,800
336 4,376,801
378 4,376,802
408 4,376,803
4,376,804
409 4,376,805
469 4,376,806
528 4,376,807
558 4,376,808

CLASS 429
62 4,376,809
90 4,376,810
101 4,376,811

CLASS 430
100 4,376,813
272 4,376,814
313 4,376,815
347 4,376,816
578 4,376,817
623 4,376,818

CLASS 431
66 4,376,626
192 4,376,627

CLASS 433
80 4,376,628
200 4,376,629

CLASS 435
4 4,376,819
4,376,820
68 4,376,821
4,376,822
73 4,376,823
94 4,376,824
188 4,376,825
253 4,376,826

CLASS 436
2 4,376,827
97 4,376,828
502 4,376,634

CLASS 445
28 4,376,328

CLASS 455
90 4,377,003
176 4,377,004
327 4,377,005
603 4,377,006

CLASS 464
88 4,376,630

CLASS 474
255 4,376,631

CLASS 501
64 4,376,829
97 4,376,652
140 4,376,830
4,376,831

CLASS 521
115 4,376,832
122 4,376,833
159 4,376,834

CLASS 523
116 4,376,835

CLASS 524
197 B1 3,931,088
100 4,376,836
108 4,376,837
184 4,376,838
303 4,376,839
779 4,376,840

CLASS 525
23 4,376,841
27 4,376,842
83 4,376,843
117 4,376,844
196 4,376,845
205 4,376,846
262 4,376,847
452 4,376,848
490 4,376,849

CLASS 526
196 4,376,850
351 4,376,851

CLASS 527
314 4,376,852

CLASS 528
1 4,376,853
137 4,376,854
271 4,376,855
292 4,376,856

CLASS 544
214 4,376,857
291 4,376,858
348 4,376,859

CLASS 546
268 4,376,860

CLASS 548
237 4,376,861
249 4,376,862

CLASS 549
268 4,376,733
292 4,376,863
373 4,376,864
521 4,376,865

CLASS 560
60 4,376,866

CLASS 562
424 4,376,867
465 4,376,868

CLASS 568
1 4,376,869
15 4,376,870
366 4,376,871

CLASS 604
387 4,376,440

D2—	232	268,220		30	268,233		351	268,246		196	268,259	D17—	20	268,272		31	268,285
	322	268,221		36	268,234		383	268,247		209	268,260	D20—	44	268,273		49	268,286
	367	268,222		38	268,235	D9—	372	268,248		211	268,261	D21—	59	268,274		68	268,287
D3—	30.1	268,223		63	268,236		375	268,249	D13—	24	268,262		63	268,275	D25—	74	268,288
	38	268,224		114	268,237		438	268,250	D14—	6	268,263		107	268,276	D27—	10	268,289
D4—	21	268,225		136	268,238		456	268,251		17	268,264		191	268,277	D28—	13	268,290
	38.1	268,226		178	268,239	D10—	60	268,252		58	268,265		195	268,278		48	268,291
		268,227			268,240		64	268,253	D15—	72	268,266	D23—	9	268,279		83	268,292
		268,228		191	268,241		73	268,254	D16—	1	268,267		71	268,280	D47—	6 E	268,293
		268,229		242	268,242	D11—	152	268,255		10	268,268		127	268,281			268,294
		268,230	D7—	102	268,243		155	268,256		32	268,269		151	268,282	D59—	2 C	268,295
		268,231		104	268,244	D12—	105	268,257		47	268,270		155	268,283	D92—	25	268,296
D6—	5	268,232	D8—	42	268,245		164	268,258		102	268,271	D24—	8	268,284			268,297

CLASSIFICATION OF PLANTS

P.—	8	4,990	21	4,992	30	4,994	65	4,996	89	4,998	4,999
	9	4,991	22	4,993	54	4,995	80	4,997			

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,376,405
4,376,666
04 : 4,376,332
4,376,397
4,376,939
4,376,960
4,376,975
05 : 4,376,596
06 : Re.31,173
Re.31,178
4,376,312
4,376,315
4,376,328
4,376,354
4,376,362
4,376,366
4,376,372
4,376,376
4,376,377
4,376,382
4,376,399
4,376,406
4,376,416
4,376,433
4,376,448
4,376,449
4,376,457
4,376,482
4,376,495
4,376,513
4,376,521
4,376,536
4,376,546
4,376,558
4,376,564
4,376,568
4,376,580
4,376,604
4,376,608
4,376,629
4,376,637
4,376,644
4,376,654
4,376,662
4,376,663
4,376,672
4,376,703
4,376,710
4,376,739
4,376,752
4,376,753
4,376,796
4,376,798

4,376,799
4,376,803
4,376,804
4,376,825
4,376,830
4,376,831
4,376,870
4,376,898
4,376,901
4,376,906
4,376,908
4,376,922
4,376,927
4,376,929
4,376,933
4,376,942
4,376,950
4,376,963
4,376,987
4,376,997
08 : 4,376,331
4,376,347
09 : 4,376,314
4,376,432
4,376,445
4,376,446
4,376,469
4,376,509
4,376,522
4,376,547
4,376,834
4,376,897
4,376,916
4,376,920
4,376,965
4,376,979
4,376,981
4,376,996
10 : 4,376,869
12 : 4,376,341
4,376,346
4,376,409
4,376,418
4,376,421
4,376,422
4,376,435
4,376,485
4,376,486
4,376,511
4,376,520
4,376,587
4,376,588
4,376,589

4,376,595
4,376,684
4,376,743
4,376,756
4,376,759
4,376,767
4,376,935
13 : 4,376,344
4,376,496
15 : 4,376,343
4,376,373
17 : 4,376,322
4,376,327
4,376,334
4,376,350
4,376,355
4,376,361
4,376,386
4,376,403
4,376,442
4,376,473
4,376,474
4,376,493
4,376,507
4,376,508
4,376,539
4,376,554
4,376,592
4,376,605
4,376,606
4,376,674
4,376,736
4,376,791
4,376,819
4,376,883
4,376,884
4,376,886
4,376,949
4,377,006
18 : 4,376,488
4,376,827
4,376,828
4,376,860
4,376,915
4,376,953
4,376,956
19 : 4,376,532
4,376,824
20 : 4,376,317
4,376,966
4,376,974
4,376,993
21 : 4,376,638

4,376,668
4,376,670
4,376,696
4,376,721
4,376,807
4,376,932
22 : 4,376,367
4,376,394
4,376,633
4,376,676
24 : 4,376,313
4,376,498
4,376,620
4,376,660
4,376,746
4,376,921
25 : 4,376,489
4,376,538
4,376,610
4,376,652
4,376,675
4,376,678
4,376,686
4,376,713
4,376,716
4,376,811
4,376,815
4,376,926
4,376,938
4,376,940
4,376,967
4,376,972
26 : 4,376,353
4,376,359
4,376,401
4,376,424
4,376,429
4,376,561
4,376,621
4,376,641
4,376,723
4,376,744
4,376,749
4,376,764
4,376,826
4,376,850
4,376,858
4,376,861
27 : 4,376,338
4,376,360
4,376,450
4,376,611
4,376,630

4,376,787
4,376,874
4,376,976
28 : 4,376,591
4,376,601
29 : 4,376,385
4,376,447
4,376,506
4,376,584
4,376,655
4,376,708
30 : 4,376,607
31 : 4,376,738
33 : 4,376,390
34 : Re.31,176
Re.31,180
4,376,363
4,376,491
4,376,502
4,376,505
4,376,549
4,376,559
4,376,622
4,376,665
4,376,685
4,376,709
4,376,711
4,376,712
4,376,719
4,376,722
4,376,725
4,376,762
4,376,763
4,376,769
4,376,774
4,376,782
4,376,806
4,376,814
4,376,839
4,376,863
4,376,865
4,376,895
4,376,924
4,376,941
4,376,946
4,376,948
4,376,952
4,376,954
4,376,955
4,376,957
35 : 4,376,462
4,376,751
36 : Re.31,175

Re.31,181
Re.31,182
4,376,318
4,376,349
4,376,380
4,376,411
4,376,437
4,376,456
4,376,500
4,376,529
4,376,544
4,376,570
4,376,576
4,376,614
4,376,616
4,376,624
4,376,635
4,376,688
4,376,697
4,376,775
4,376,790
4,376,800
4,376,893
4,376,900
4,376,912
4,376,969
4,376,978
4,376,982
37 : 4,376,404
4,376,434
4,376,583
4,376,603
4,376,636
4,376,650
39 : 4,376,321
4,376,340
4,376,356
4,376,410
4,376,417
4,376,497
4,376,512
4,376,551
4,376,556
4,376,563
4,376,619
4,376,631
4,376,634
4,376,742
4,376,747
4,376,757
4,376,812
4,376,838
4,376,845

	4,376,853		4,376,542		4,376,902		4,376,443		4,376,999		4,376,598
	4,376,857		4,376,560		4,376,904		4,376,464	49 :	4,376,395		4,376,745
	4,376,872		4,376,562		4,376,913		4,376,468		4,376,470	55 :	4,376,316
40 :	4,376,358		4,376,565		4,376,928		4,376,524		4,376,647		4,376,319
	4,376,425		4,376,566		4,376,968		4,376,526	51 :	4,376,388		4,376,345
	4,376,463		4,376,609		4,377,000		4,376,597		4,376,510		4,376,419
	4,376,518		4,376,615	44 :	4,376,623		4,376,659		4,376,801		4,376,440
	4,376,693		4,376,639	45 :	4,376,368		4,376,732		4,376,802		4,376,455
	4,376,698		4,376,640		4,376,483		4,376,793		4,376,821		4,376,465
	4,376,699		4,376,643		4,376,729		4,376,832		4,376,822		4,376,671
	4,376,851		4,376,673	47 :	4,376,384		4,376,855		4,376,877		4,376,679
	4,376,868		4,376,677		4,376,755		4,376,947		4,376,917		4,376,823
41 :	4,376,550		4,376,700		4,376,792		4,376,983	53 :	4,376,392		4,376,970
42 :	4,376,365		4,376,772	48 :	4,376,339		4,376,998		4,376,582	56 :	4,376,467
	4,376,441		4,376,844		4,376,402						

DESIGN PATENTS

01 :	268,235		268,258	11 :	268,236	29 :	268,234		268,264	41 :	268,252
	268,253		268,259	13 :	268,295		268,273		268,267	42 :	268,233
05 :	268,254		268,263	14 :	268,222	31 :	268,249		268,274		268,262
06 :	268,221		268,272	17 :	268,268	34 :	268,225		268,275	48 :	268,285
	268,237		268,279	25 :	268,251		268,242	39 :	268,257	53 :	268,277
	268,241		268,283	26 :	268,220	36 :	268,223		268,281		268,278
	268,247		268,284		268,255		268,234		268,282	54 :	268,286
	268,250		268,289	27 :	268,266		268,238		268,287	55 :	268,246
	268,256										

PLANT PATENTS

06 :	4,990	4,994	4,995	34 :	4,998	4,999	36 :	4,996	

U.S. GOVERNMENT PRINTING OFFICE : O—1983

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402